APPENDIX I

OPERATIONAL IMPROVEMENTS

Appendix I contains the Next Generation Air Transportation System (NextGen) Operational Improvements (OI) in numerical order according to their unique identification number. OIs describe a specific operational transformation needed or an improved level of performance to achieve the FY 2025 NextGen vision, as defined in the Concept of Operations.

Each listing displays a timetable and the following information for each OI:

- **Operational Improvement Description:** The OI description defines the specific operational transformation or an improved level of performance of NextGen operations. It provides the context, constraints and measures of the improved operations as well as a summary of the required elements needed to achieve the operational performance improvement.
- **Functional Drivers:** Additional information that provides functional requirements of the OI.
- **Suggested Office of Primary Responsibility (SOPR):** The suggested Partner that will have primary responsibility for this OI.
- **Suggested Office of Collateral Responsibility (SOCR):** The suggested Partner (s) that will collaborate with the SOPR to implement the OI.
- **OI Group:** The Functional Group where the OI is cataloged.
- **SOPR Unique Reference:** If the OI is aligned with a specific SOPR program or defined investment, the unique reference used within the SOPR is listed in this field. For the OI's aligned with the FAA, this unique number is the NAS Architecture OI number.
- **Primary Supported OIs:** If the OI is required to support other OIs, this field lists those OIs that are directly supported by the reference OI. Other OIs may also be supported by the reference OI through secondary relationships with the primary supported OIs.
- **Initial Operational Capability (IOC):** The reference OI number, title and IOC date are listed on the first line of the timetable. The IOC date is listed as well as indicated with a green square with an 'O' label in the IOC year within the timetable.
- **Primary Prerequisites:** The primary prerequisite planning elements required to implement the reference OI. Further information on the listed planning elements, including secondary prerequisites, can be found in the Appendix or the Joint Planning Environment (JPE).
- **Prerequisite's Initial Availability Date:** The timetable lists the initial availability dates for each prerequisite Enabler, R&D Activity and Policy Issue, or IOC date for prerequisite OIs. Each of the elements listed are key for the realization of this particular improvement and must be available before or on the IOC date.

Complete information on IWP planning elements is available in the interactive Joint Planning Environment (JPE). The JPE is available at www.jpdo.gov.

Operational Improvement Listing

OI-0303 TMI with Flight-Specific Trajectories

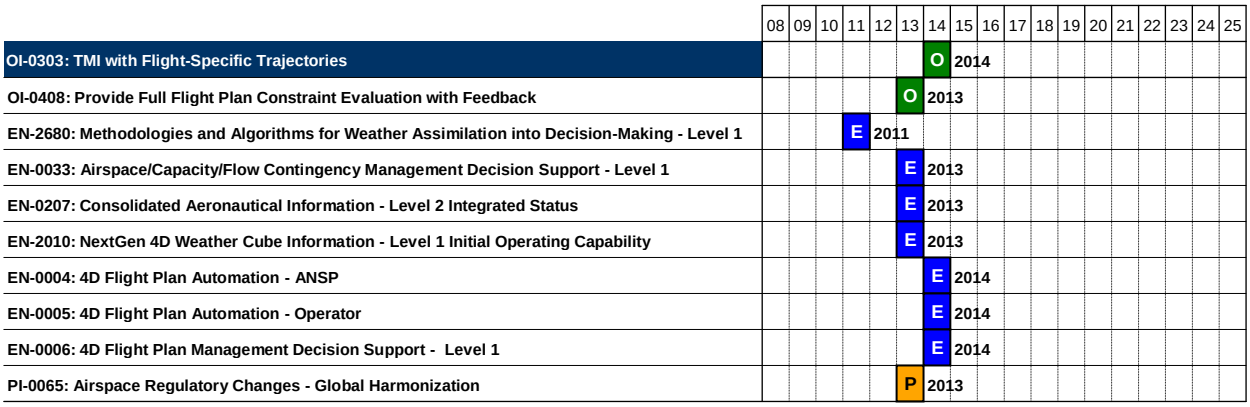
Description: Individual flight-specific trajectory changes resulting from Traffic Management Initiatives (TMIs) will be disseminated to the appropriate Air Navigation Service Provider (ANSP) automation for tactical approval and execution. This capability will increase the agility of the National Airspace System (NAS) to adjust and respond to dynamically changing conditions such as bad weather, congestion, and system outages.

Functional Drivers: Rerouting TMIs are developed in collaboration with operators and are distributed across time horizons for in-flight En Route solutions. TFM specialists collaborate with operators to select efficient TMIs to solve flow problems. TMIs are distributed to manage airborne rerouting based on probabilities of weather predictions and other uncertainties. TFM initiatives for En Route flights are provided to ANSP personnel and flight operators in a machine-executable form to expedite implementation.

SOPR: FAA ***SOPR Unique Reference:*** 105208

SOCR: ***Primary Supported OIs:*** OI-0306

OI Group: Flow Contingency Management Operational Improvements



OI-0304 Flexible Entry Times for Oceanic Tracks

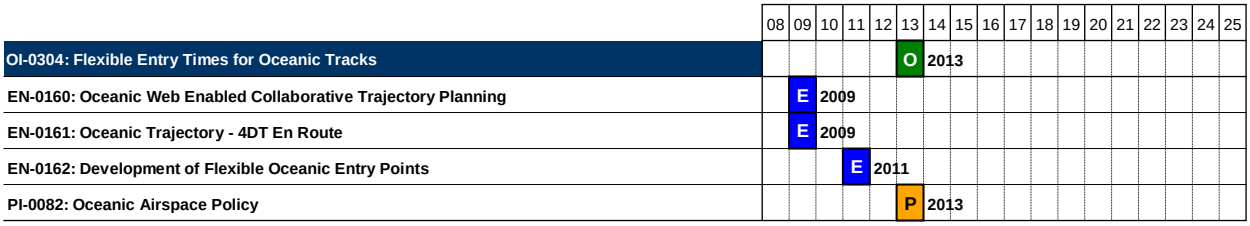
Description: Flexible entry times into oceanic tracks or flows allow greater use of user-preferred trajectories. Under the Oceanic Trajectory Management Four Dimensional (OTM4D) pre-departure concept, flexible entry times into oceanic tracks allow aircraft to fly minimum time/fuel paths. Air Navigation Service Provider (ANSP) automation reviews the request and negotiates adjustments to entry time requests. By incorporating entry optimization algorithms within the request review process, flights trade-off some near-term suboptimal profiles to achieve more optimal oceanic profiles.

Functional Drivers: Oceanic route efficiency is improved through collaborative negotiation of entry times and track loading and oceanic traffic handling is improved through comparison of current routes against desired profiles to identify beneficial control actions. The negotiation for entry times includes looking ahead to plan near-term climbs when loading tracks. Oceanic 4D profiles of active flights are continually examined to determine control actions that enhance oceanic capacity while providing improved efficiency within traffic flows.

SOPR: FAA ***SOPR Unique Reference:*** 104102

SOCR: ***Primary Supported OIs:***

OI Group: Trajectory Management - En Route/Multi-Domain Operational Improvements



Operational Improvement Listing

OI-0305 Continuous Flight Day Evaluation

Description: Air Navigation Service Providers (ANSPs) and users collaboratively and continuously assess (monitor and evaluate) constraints (e.g., airport, airspace, hazardous weather, sector workload, Navigational Aid (NAVAID) outages, security) and associated Traffic Management Initiative (TMI) mitigation strategies. Users and ANSP dynamically adjust both pre-departure and airborne trajectories in response to anticipated and real-time constraints. ANSP, in collaboration with users, develops mitigation strategies that consider the potential constraints. A pre-defined set of alternatives is developed that maximizes airspace and airport capacity and throughput. ANSP and users use (real-time) constraint information and these mitigation strategies to increase operational predictability and throughput. ANSP automation traffic management decision-support tools perform a post-operational assessment of National Airspace System (NAS) performance. This capability includes ANSP automation to collect and support the analysis of airspace, airport, and flight day operational data as part of a comprehensive post-flight day analysis capability applicable to multiple domains and for multiple purposes. Flight day metrics are compared with performance metrics from each element of the system (e.g., aircraft, pilot, controller, airspace). NAS and operational resources are aligned to meet anticipated demand. This improves the ANSP pre-defined shared plans. Long-term planning functions will improve due to continuous flight day evaluation. NAS performance will be improved and decision-makers will be able to predict and plan operations based on a validated tool.

SOPR: FAA ***SOPR Unique Reference:*** 105302

SOCR: ***Primary Supported OIs:***

OI Group: Trajectory Management - En Route/Multi-Domain Operational Improvements

OI-0306 Provide Interactive Flight Planning from Anywhere

Description: Flight planning activities are accomplished from the flight deck as readily as any location. Airborne and ground automation provide the capability to exchange flight planning information and negotiate flight trajectory contract amendments in near real-time. The key change is that the Air Navigation Service Provider's (ANSP) automation allows the user to enter the flight plan incrementally with feedback on conditions for each segment. Rather than testing full trajectories by submitting and waiting for full routes evaluations, the system will test each segment as entered and provide feedback. Through this process the user will work with the system to quickly reach a flight plan agreement. As before any subsequent change, constraint, preference, or intent triggers a full flight plan review with feedback to the filer. The filer can develop preferred trajectories that may include an identified constraint that the automation system maintains in case subsequent changes to conditions will allow its promotion to agreement. Automation thus maintains multiple flight plans for an individual flight.

Functional Drivers: These services include a common flow strategy and trajectory analysis service that enables common situational awareness of current and projected air traffic management system status and constraints. This capability will allow operators with multiple aircraft involved in a traffic management initiative to have the flexibility to adjust their individual aircraft schedules and trajectories within their allocations to accommodate their own internal priorities.

SOPR: FAA ***SOPR Unique Reference:*** 101103

SOCR: ***Primary Supported OIs:***

OI Group: Flow Contingency Management Operational Improvements

Operational Improvement Listing

	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
OI-0306: Provide Interactive Flight Planning from Anywhere											O 2018							
OI-0408: Provide Full Flight Plan Constraint Evaluation with Feedback						O 2013												
OI-0303: TMI with Flight-Specific Trajectories							O 2014											
EN-2680: Methodologies and Algorithms for Weather Assimilation into Decision-Making - Level 1				E 2011														
EN-0207: Consolidated Aeronautical Information - Level 2 Integrated Status						E 2013												
EN-2010: NextGen 4D Weather Cube Information - Level 1 Initial Operating Capability						E 2013												
EN-0002: Network-Enabled Flight Object Information							E 2014											
EN-0004: 4D Flight Plan Automation - ANSP							E 2014											
EN-0005: 4D Flight Plan Automation - Operator							E 2014											
EN-1216: Air - Ground Data Exchange – FIS – En Route							E 2014											
EN-1217: Air - Ground Data Exchange – FIS – TRACON										E 2017								
EN-0003: 4D Flight Plan Management Decision Support - Level 2											E 2018							
EN-1224: Air - Ground Data Exchange – Flight Position Intent Services – Multi Domain											E 2018							
PI-0077: High Density Operations - Flight Prioritization							P 2014											

OI-0307 Integrated Arrival/Departure Airspace Management

Description: New airspace design takes advantage of expanded use of terminal procedures and separation standards. This is particularly applicable in major metropolitan areas supporting multiple high-volume airports. This increases aircraft flow and introduces additional routes and flexibility to reduce delays. Air Navigation Service Provider (ANSP) decision support tools are instrumental in scheduling and staging arrivals and departures based on airport demand, aircraft capabilities, and gate assignments. This capability expands the use of terminal separation standards and procedures (e.g., 3 nm, degrees divergence, and visual separation) within the newly defined transition airspace. It extends further into current en route airspace (horizontally and vertically). A redesign of the airspace will permit a greater number of Area Navigation (RNAV) and Required Navigation Performance (RNP) procedures within the transition airspace to allow for increased throughput. Extended application of terminal procedures and separation standards allows greater flexibility for traffic to be re-routed during severe weather and other disruptions to normal flows. Certain routes can be bi-directional and are used for either arrival or departure, depending on the traffic situation and the location of the severe weather.

Functional Drivers: There are a number of pre-defined configurations for arrival/departure airspace (including arrival/departure routes, airspace boundaries, etc) that are tailored to typical flow patterns and weather events. These configurations are stored in automation adaptations and can be easily selected (either as planned configuration changes or they can be selected to meet unanticipated situations). This will be transparent to pilots with exception of the assignment of different arrival/departure routes done as clearance amendments. When a planned airspace change will affect access (e.g., due to increased performance requirements), this will have to be communicated to affected flights. Separation managers and trajectory managers will need to be able to adjust to a finer set of changes than is done today with sector splits/recombines. For flight planning, known changes to configuration are available to flight planners.

SOPR: FAA ***SOPR Unique Reference:*** 104122

SOCR: ***Primary Supported OIs:*** OI-0406

OI Group: Capacity Management Operational Improvements

	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
OI-0307: Integrated Arrival/Departure Airspace Management								O 2015										
OI-0351: Flexible Airspace Management								O 2015										
EN-2680: Methodologies and Algorithms for Weather Assimilation into Decision-Making - Level 1				E 2011														
EN-0033: Airspace/Capacity/Flow Contingency Management Decision Support - Level 1						E 2013												
EN-0034: Trajectory Management Decision Support - Level 1						E 2013												
EN-2010: NextGen 4D Weather Cube Information - Level 1 Initial Operating Capability						E 2013												
EN-0300: Networked Air Navigation Support Facilities								E 2015										
EN-1037: Ground Voice Network - NAS Voice Switch Level 2								E 2015										
EN-1143: Ground Based Navigation System (GBNS) - eLORAN								E 2015										

Operational Improvement Listing

OI-0309 Use Optimized Profile Descent

Description: An Optimized Profile Descent (OPD), in its optimal form, is an arrival where aircraft is cleared to descend from cruise altitude to final approach using the most economical power setting at all times. Based on published arrival procedures at final approach, aircraft begin a continuous rate of descent using a window of predetermined height and distance. Thrust may be added to permit a safe, stabilized approach-speed and flap-configuration down a glide slope to the runway. As an initial step, conventional or Area Navigation (RNAV) Standard Terminal Automation Replacement Systems (STARs) can be defined with vertical constraints incorporated as crossing restrictions. Careful selection of constraints allows most aircraft Flight Management System (FMS) Visual Navigation (VNAV) systems to calculate a continuously descending flight path, although the flight path may require a slightly non-optimal power setting. In addition, static spacing guidance, based on weight class and winds, as well as speed commands for descending traffic, allows STAR to be used with minimal impact to airport throughput, although with a slight additional environmental penalty compared to the ideal STAR OPD. At busy airports, achieving full fuel/emissions/noise benefits will be difficult without impacting capacity, unless advanced avionics and/or ground capabilities, and perhaps larger-scale airspace redesign are added.

Functional Drivers: Alternative initial implementations are underway and will be used to develop guidance for the broader implementation of OPDs throughout the NAS.

SOPR: FAA ***SOPR Unique Reference:*** 104124

SOCR: ***Primary Supported OIs:*** OI-0325, OI-0330, OI-0311

OI Group: Trajectory Management - Arrival/Departure Operational Improvements

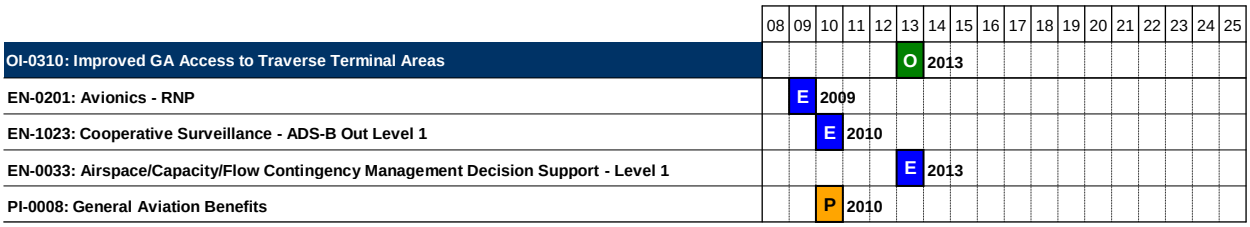
OI-0310 Improved GA Access to Traverse Terminal Areas

Description: This Operational Improvement (OI) results in increased access to busy airspace, such as Class B, for General Aviation (GA) operators. More direct routing for GA operators is facilitated through improved access to traverse busy terminal area airspace via the continued use and possible expansion of Visual Flight Rules (VFR) Flyways as well as by the utilization of Automatic Dependent Surveillance-Broadcast (ADS-B) technologies. Typically, GA operators have to fly "around" busy airspace, with associated penalties in efficiency. With this OI a GA flight is more likely to transit through busy airspace when the desired flight path crosses that airspace. Major benefits are access and efficiency. This OI primarily affects arrival/departure airspace and En Route airspace. Roles/Responsibilities: Based on the initial planned solution (static corridors), there are no changes in roles/responsibilities.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-0339

OI Group: Capacity Management Operational Improvements



Operational Improvement Listing

OI-0311 Increased Capacity and Efficiency Using RNAV and RNP

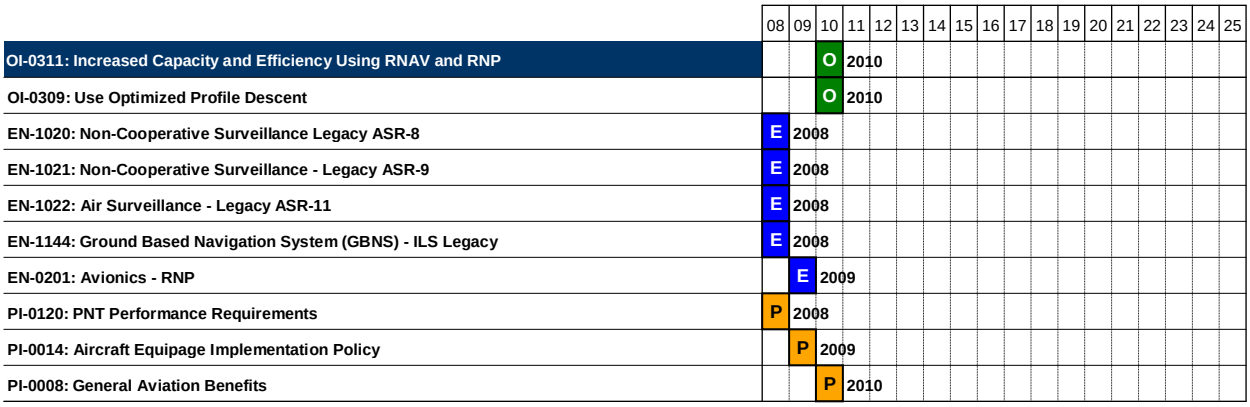
Description: Both Area Navigation (RNAV) and Required Navigational Performance (RNP) will enable more efficient aircraft trajectories. RNAV and RNP combined with airspace changes, increase airspace efficiency and capacity. RNAV and RNP will permit the flexibility of point-to-point operations and allow for the development of routes, procedures, and approaches that are more efficient and free from the constraints and inefficiencies of the ground-based Navigational Aids (NAVAIDS). This capability can also be combined with an Instrument Landing System (ILS), to improve the transition onto an ILS final approach and to provide a guided missed approach. Consequently, RNAV and RNP will enable safe and efficient procedures and airspace that address the complexities of the terminal operation through repeatable and predictable navigation. These will include the ability to implement curved path procedures that can address terrain, and noise-sensitive and/or special-use airspace. Terminal and en route procedures will be designed for more efficient spacing and will address complex operations.

Functional Drivers: Performance-based RNAV and RNP will help to increase access and options for airport utilization as well as reduce overall environmental impact by addressing noise, emissions and fuel use in the development and use of routes and procedures.

SOPR: FAA ***SOPR Unique Reference:*** 108209

SOCR: ***Primary Supported OIs:*** OI-0330

OI Group: Trajectory Management - Arrival/Departure Operational Improvements



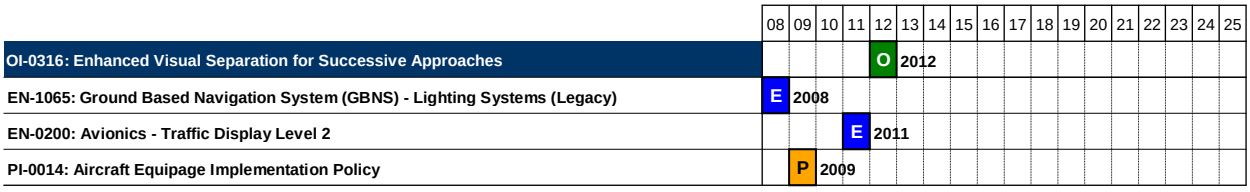
OI-0316 Enhanced Visual Separation for Successive Approaches

Description: This Operational Improvement (OI) increases runway throughput in low ceiling and visibility conditions by allowing an aircraft to augment out-the-window visual separation information with onboard traffic display information on a visual approach. After establishing initial visual contact, the aircraft can continue a visual approach while traversing a light cloud layer, using the onboard traffic display briefly to augment situational awareness until visual contact is reestablished. The flight crew is responsible for safe wake separation during augmented visual approaches. This OI enables Visual Meteorological Condition (VMC) runway capacity levels to be achieved in marginal VMC for single, parallel and converging runways.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-0326

OI Group: Trajectory Management - Arrival/Departure Operational Improvements



Operational Improvement Listing

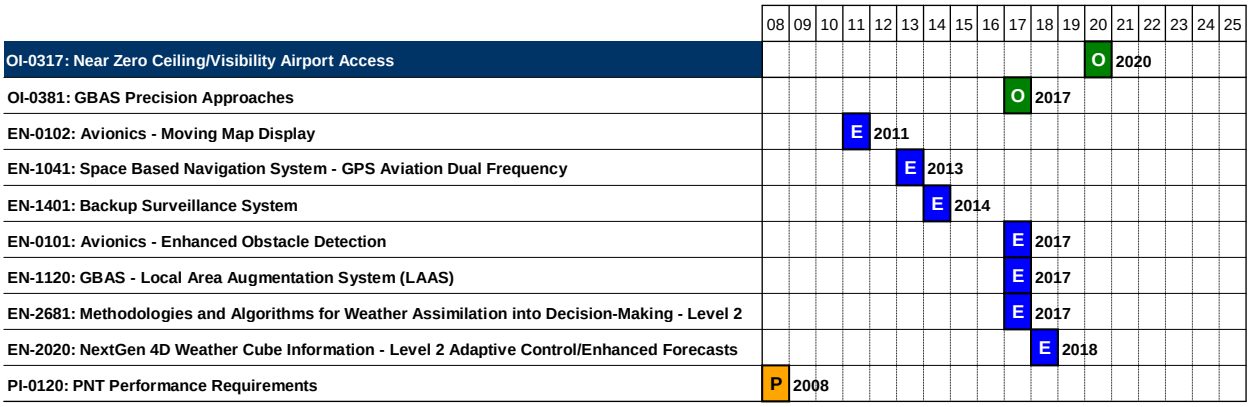
OI-0317 Near Zero Ceiling/Visibility Airport Access

Description: Near Zero Ceiling/Visibility Airport Access is available where needed through a combination of complementary airborne and ground functionality to aid the pilot in approach guidance and acquisition of the runway environment for safe operations. Near zero ceiling/visibility approaches are available for all suitably-equipped users through a combination of complementary airborne and ground equipage. Implementation may involve on-board synthetic and enhanced vision systems, and Ground-Based Augmentation Systems (GBAS), and low-cost runway/taxiway lighting.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-0340

OI Group: Trajectory Management - Arrival/Departure Operational Improvements



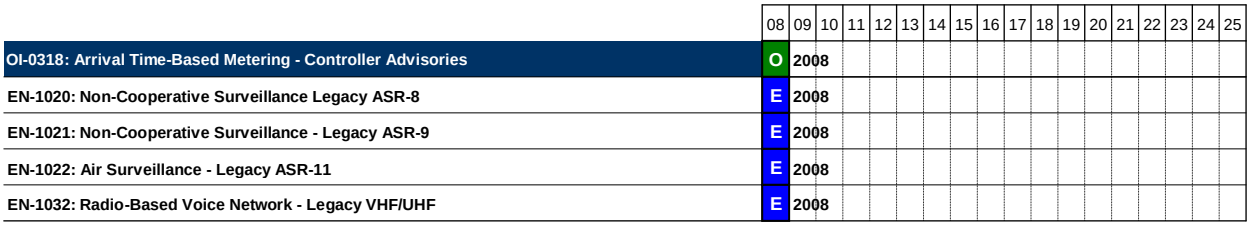
OI-0318 Arrival Time-Based Metering - Controller Advisories

Description: Improved regularity of arrival flows into busy terminal areas through providing time-based metering advisories to controllers reduces "bunching" and the number of lost landing opportunities at the runway thresholds. Arrival time-based metering is available at least at one Terminal Radar Approach Control (TRACON) in every Air Route Traffic Control Center (ARTCC). The benefit of this Operational Improvement (OI) is increased terminal throughput, better achievement of full capacity, and improved operator efficiency (less holding, fewer airborne delays). This OI is based on the Traffic Management Advisor (TMA) to provide metering advisories to controllers. It provides decreased uncertainty in delivery to terminal boundaries for arrivals. Enablers: ability to predict desired time for an aircraft to arrive at a terminal boundary; ability to schedule time of arrival ensuring all realizable landing slots are filled; ability to "control" conflict free aircraft to arrive at the desired time into terminal boundaries (done manually today through controllers using metering times from TMA and their controller skills).

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-0331

OI Group: Trajectory Management - Arrival/Departure Operational Improvements



Operational Improvement Listing

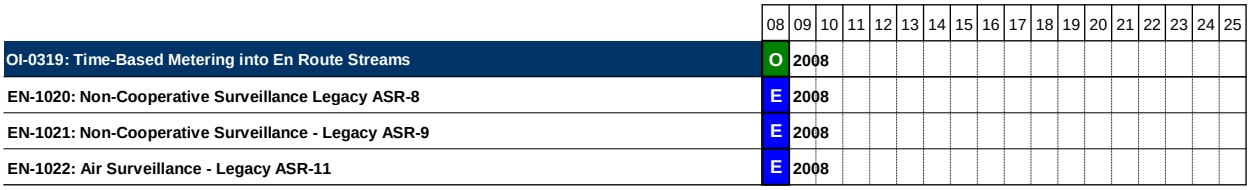
OI-0319 Time-Based Metering into En Route Streams

Description: This Operational Improvement (OI) provides increased departure throughput via manual time-based control of departing aircraft into an overhead stream using a decision support tool insuring that all available gaps in the En Route stream are filled. It also provides departure and en-route time-based control for complex metropolitan airspace where there are multiple departure streams to sequence aircraft over a single en-route fix.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Trajectory Management - Arrival/Departure Operational Improvements



OI-0320 Initial Surface Traffic Management

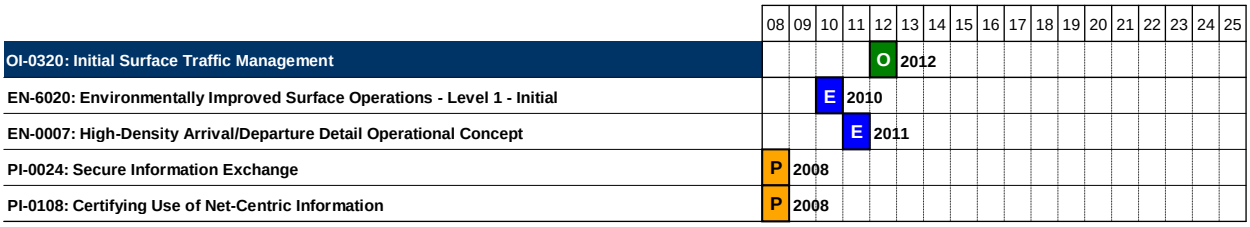
Description: Departures are sequenced and staged to maintain throughput. Air Navigation Service Provider (ANSP) automation uses departure-scheduling tools to flow surface traffic at high-density airports. Automation provides surface sequencing and staging lists for departures and average departure delay (current and predicted). ANSP automated decision support tools integrate surveillance data. This includes weather data, departure queues, aircraft flight plan information, runway configuration, expected departure times, and gate assignments. Automation provides surface sequencing and staging lists for departures and average departure delay (current and predicted). Local collaboration between ANSP and airport stakeholders improves information flow to decision support as well as the ability for aircraft operators to meet their operational and business objectives.

Functional Drivers: The use of improved departure scheduling and surface management will reduce delays and environmental impacts resulting in more efficient operations.

SOPR: FAA ***SOPR Unique Reference:*** 104209

SOCR: ***Primary Supported OIs:*** OI-0322, OI-0321

OI Group: Trajectory Management - Surface Operational Improvments



OI-0321 Enhanced Surface Traffic Operations

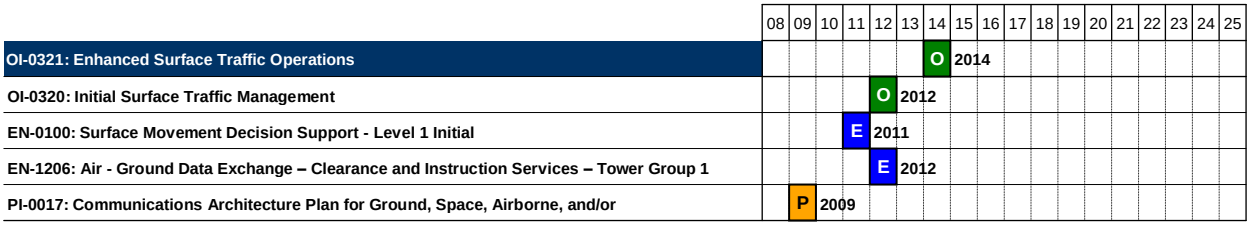
Description: Terminal automation provides the ability to transmit automated terminal information, departure clearances and amendments, and taxi route instructions via data communications, including hold-short instructions. The taxi route instruction data communication function reduces requests for progressive taxi instructions. Benefits arising from this capability, in conjunction with other National Airspace System (NAS) investments, include enhanced airport throughput, controller efficiency, enhanced safety, as well as reduced fuel-burn and emissions. At the outset, the current system will be expanded to include provision of initial and revised departure clearances directly to the aircraft. Initial and revised taxi route instructions will be added, replacing today's use of voice to accomplish these activities. As a second step, Aeronautical Telecommunication Network (ATN) based capabilities will be added, replacing much of today's system.

SOPR: FAA ***SOPR Unique Reference:*** 104207

SOCR: ***Primary Supported OIs:*** OI-0322, OI-0327

OI Group: Trajectory Management - Surface Operational Improvments

Operational Improvement Listing



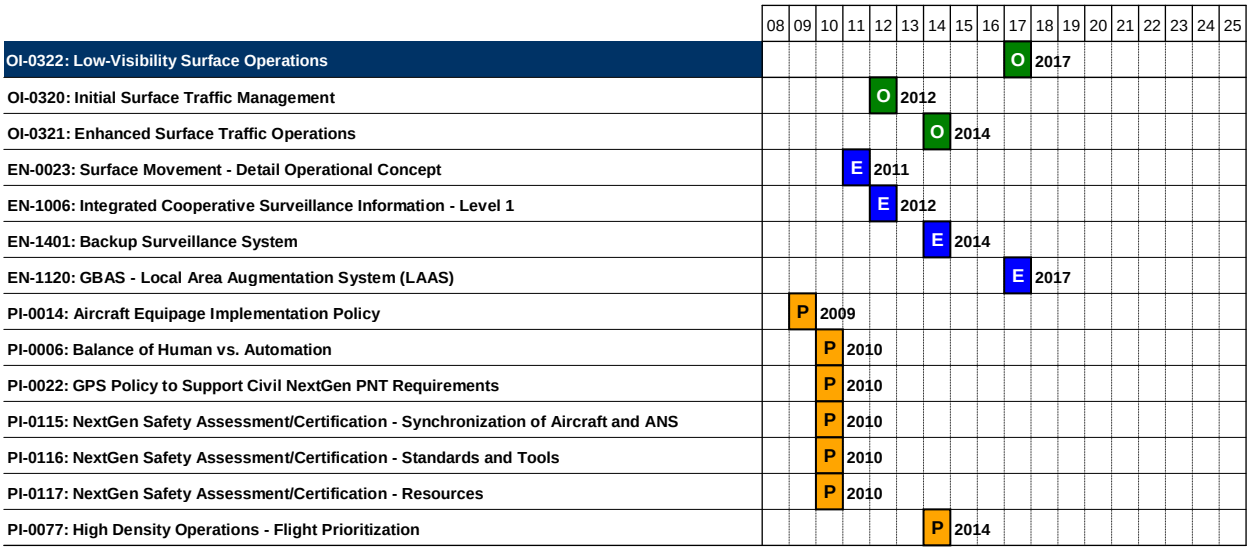
OI-0322 Low-Visibility Surface Operations

Description: Aircraft and ground vehicle movement on airports in low visibility conditions is guided by moving map displays, Cockpit Display of Traffic Information (CDTI), Automatic Dependent Surveillance-Broadcast (ADS-B) (for flight vehicles), and a Ground Support Equipment (GSE) Cooperative Surveillance System (for ground support equipment). Safety and efficiency of operations at some airports will also be enhanced by intelligent signage on the ground.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-0340, OI-0327

OI Group: Trajectory Management - Surface Operational Improvments



Operational Improvement Listing

OI-0325 Time-Based Metering Using RNP and RNAV Route Assignments

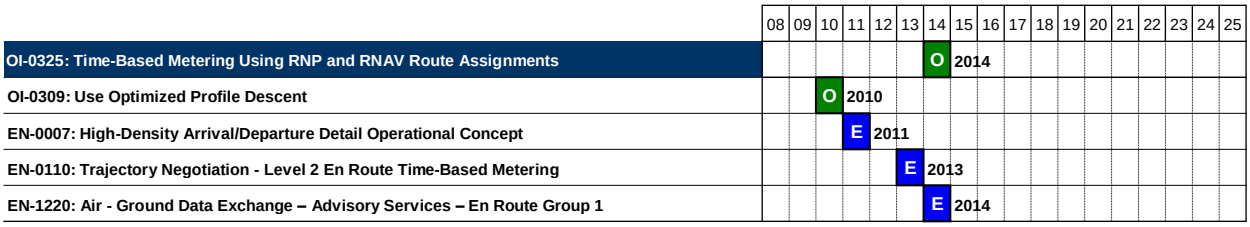
Description: Area Navigation (RNAV), Required Navigational Performance (RNP), and time-based metering provide efficient use of runways and airspace in high-density airport environments. RNAV and RNP provide users with more efficient and consistent arrival and departure routings and fuel-efficient operations. Metering automation will manage the flow of aircraft to meter fixes, thus permitting efficient use of runways and airspace. Building on increased capacity in terminal separation procedures, time-based metering will facilitate efficient arrival and departure flows. This will be accomplished using RNAV and RNP routings, coupled with meter fix crossing times. These will be issued to the flight crew via voice or data communications for input into the Flight Management System (FMS). Arrivals will be issued a RNAV routing to link arrival procedures to designated runways. Aircraft will navigate from en route to approach and landing phases with minimal adjustments (i.e., speed adjustments) or changes to flight trajectories by Air Navigation Service Provider (ANSP). Departures will be issued clearances that specify departure routings linked from RNAV routes into the en route phase of flight. This will reduce ANSP and flight crew workload, providing flexibility as well as maximizing arrival and departure throughput at high-density airports.

Functional Drivers: Collaborative Air Traffic Management (C-ATM) and time-based metering replace miles in trail restrictions. This OI provides consistent delivery of aircraft into the terminal area to match runway acceptance rates, enabling efficient and high-throughput operations. Where practical, this OI enables the application of Optimized Profile Descent (OPD) operations with RNP approaches under moderate traffic conditions, with ground-based automation providing conflict-free, time-based metering solutions for En Route and transition airspace segments. OPD is also known as Continuous Descent Arrival, or CDA.

SOPR: FAA ***SOPR Unique Reference:*** 104123

SOCR: ***Primary Supported OIs:*** OI-0331, OI-0326, OI-0330

OI Group: Trajectory Management - Arrival/Departure Operational Improvements



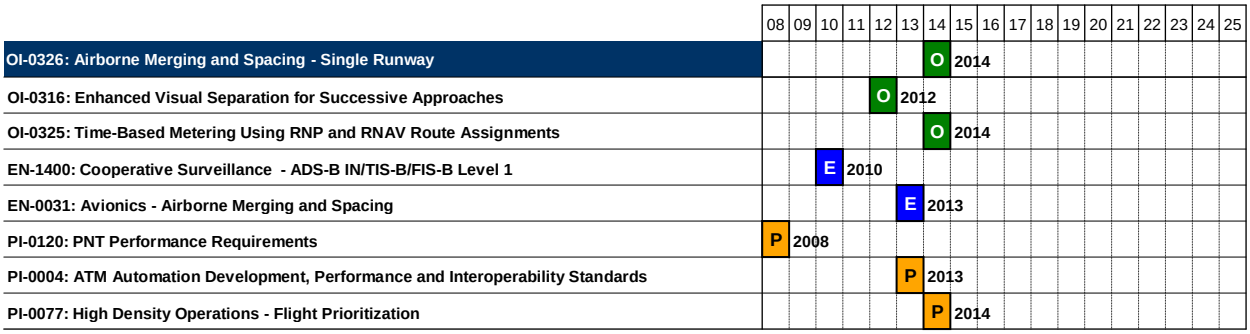
OI-0326 Airborne Merging and Spacing - Single Runway

Description: Arriving or departing aircraft to/from single runways are instructed to achieve and maintain a given spacing in time or distance from a designated lead aircraft as defined by an Air Navigation Service Provider (ANSP) clearance. Onboard displays and automation support the aircraft conducting the merging and spacing procedure to enable accurate adherence to the required spacing. Flight crews are responsible for maintaining safe and efficient spacing from the lead aircraft. Responsibility for separation from all other aircraft remains with the ANSP. Assigned spacing may include a gap to allow for an intervening departure between subsequent arrivals. Mixed-equipage operations are supported; a spacing-capable aircraft can perform airborne spacing behind a non-capable aircraft as long as it is transmitting cooperative surveillance information. This Operational Improvement (OI) includes multiple streams merging to a single runway and includes development of ANSP capability and procedures.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-0329, OI-0333

OI Group: Trajectory Management - Arrival/Departure Operational Improvements



Operational Improvement Listing

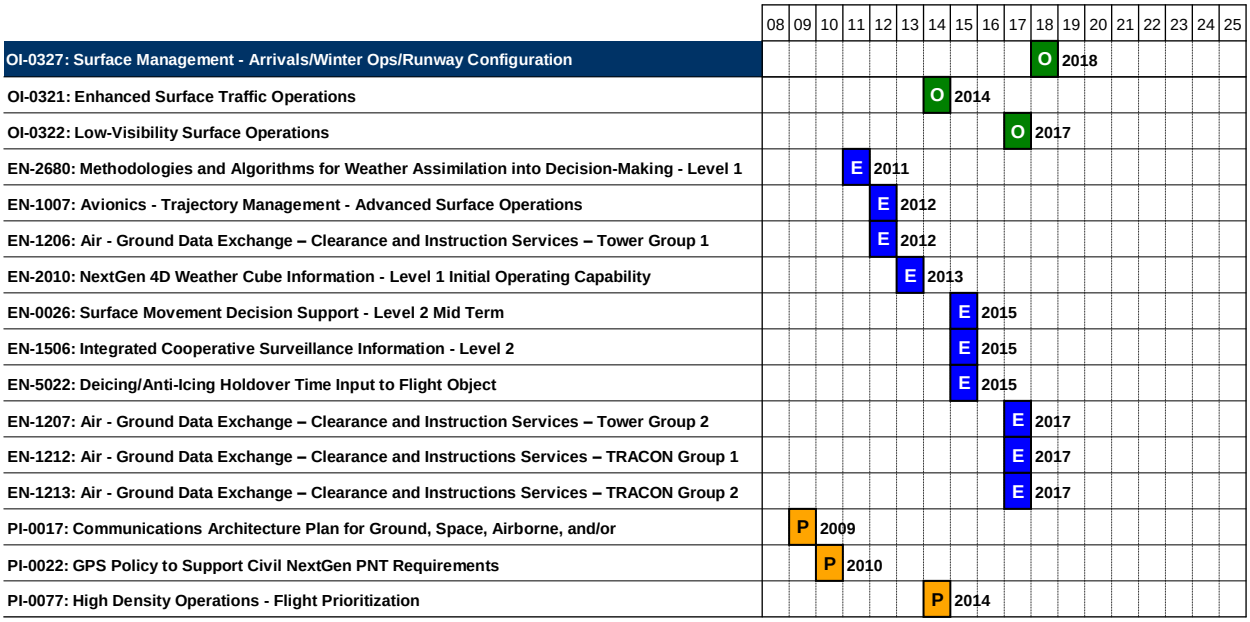
OI-0327 Surface Management - Arrivals/Winter Ops/Runway Configuration

Description: This Operational Improvement (OI) increases efficiency and safety of surface traffic movement, with corresponding reduction in environmental impacts. Efficiency of surface movement is increased through the use of automation, on-board displays and data link of taxi instructions on arrival to properly equipped aircraft to reduce delay and environmental impacts and improve safety. This OI assumes development of surface automation that is fully integrated with airborne operations and applies this to surface management operations. This OI is an extension of OI-0321 and contains those improvements as well. Surface optimization automation includes activities such as runway snow removal, aircraft de-icing, and runway configuration.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-0331

OI Group: Trajectory Management - Surface Operational Improvments



OI-0329 Airborne Merging and Spacing with OPD

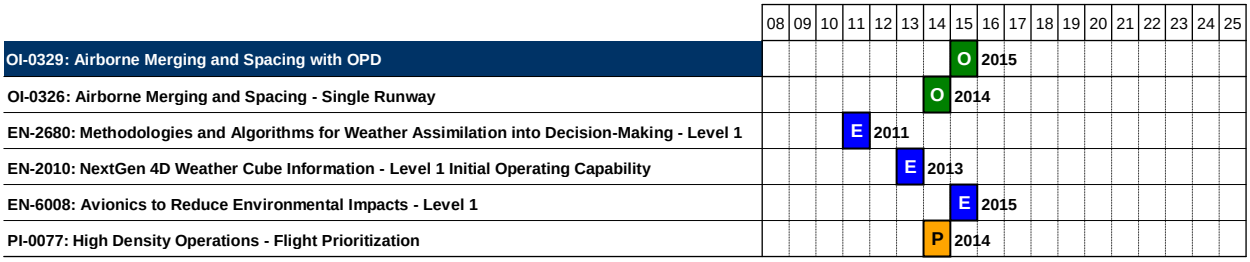
Description: Fuel consumption and noise on approaches are reduced while maintaining throughput in heavy traffic through Optimized Profile Descent (OPD) combined with airborne merging and spacing in moderate-to-heavy traffic. OPD is also known as Continuous Descent Arrival (CDA). This Operational Improvement (OI) requires airborne merging and spacing capability as well as airborne guidance to perform optimized OPD while staying within assigned lateral and vertical airspace corridor limits. This OI is complementary to OI-0325 which delivers the aircraft at top of descent with spacing to initiate a successful OPD. This OI improves individual aircraft fuel reduction through onboard energy guidance, and enables reduced spacing buffers and hence increased throughput from precision airborne spacing. Mixed equipage can be supported within a single arrival stream, with some aircraft self-spacing and other aircraft managed by Air Navigation Service Provider (ANSP). This OI requires an Implementation Decision to determine appropriate trajectory restrictions laterally, vertically, and in time, based on trade off between aircraft performance/efficiency versus optimal use of airspace, including weather and environmental constraints.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-0338

OI Group: Trajectory Management - Arrival/Departure Operational Improvements

Operational Improvement Listing



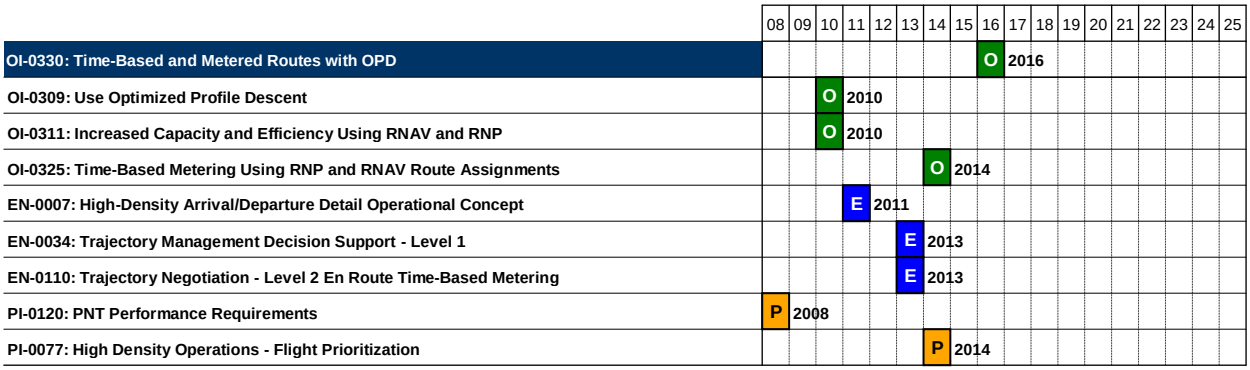
OI-0330 Time-Based and Metered Routes with OPD

Description: Time-based and metered Required Navigational Performance (RNP) routes are flown. Where practical, arrival routes support Optimized Profile Descent (OPD) operations under moderate to heavy traffic conditions, with ground-based automation providing conflict-free, time-based metering solutions over the entire OPD trajectory to the runway. OPD is also known as Continuous Descent Arrival, or CDA. This enables aircraft with minimal equipage to perform OPDs. This Operational Improvement (OI) requires an Implementation Decision to determine the most effective method for negotiating time-based route and an Implementation Decision to determine how restricted the trajectory will be laterally, vertically, and in time, based on trade off between aircraft performance/efficiency versus optimal use of airspace.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Trajectory Management - Arrival/Departure Operational Improvements



OI-0331 Integrated Arrival/Departure and Surface Operations

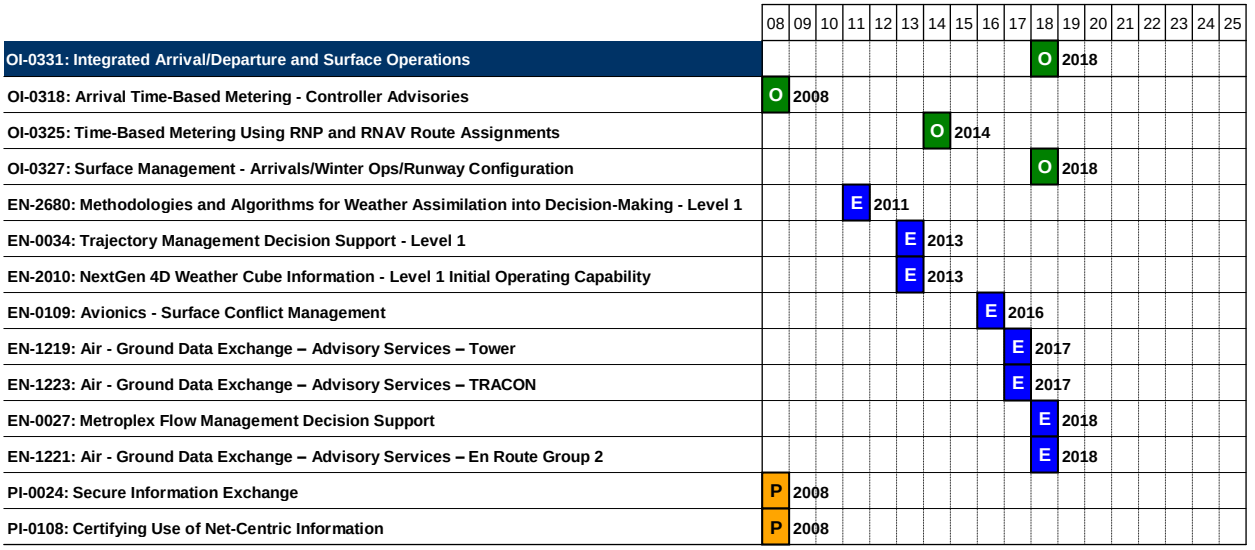
Description: This Operational Improvement (OI) integrates advanced Arrival/Departure flow management with advanced Surface operation functions to improve overall airport capacity and efficiency. Arrival and departure flows and surface operations are more effectively planned and managed through the integration of current flight plans as well as real-time airborne and surface trajectory information into Air Navigation Service Provider (ANSP) Tower and Terminal Radar Approach Control (TRACON) decision support automation tools. Improved surveillance, automation, digital communications and distribution of real-time information such as aircraft flows, trajectories, positions, intent, as well as weather information enhance efficiency of terminal area operations. These decision support tools enable ANSP flow managers to work collaboratively with flight operators and with ANSP flow contingency managers to effectively manage high-capacity arrival and departure flows in the presence of various weather conditions. The ANSP can safely make more efficient use of runways through real-time depiction of the location and intent of arrival and departure aircraft and other surface movement including aircraft intending to cross an active runway.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-0339

OI Group: Trajectory Management - Arrival/Departure Operational Improvements

Operational Improvement Listing



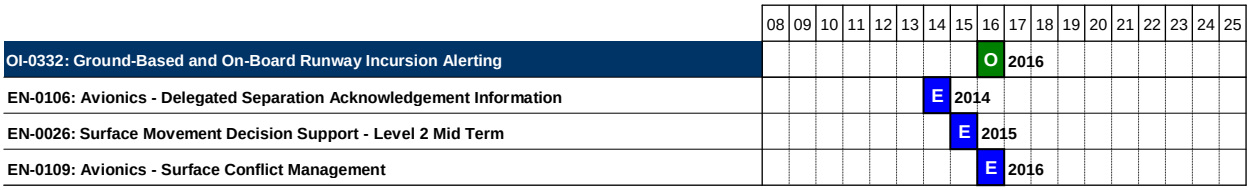
OI-0332 Ground-Based and On-Board Runway Incursion Alerting

Description: This Operational Improvement (OI) increases the safety of surface operations by reducing runway incursions. Runway incursion alerts are provided to controllers and pilots by a potential combination of ground and aircraft systems to reduce the potential of surface incidents. The combination of ground and aircraft based systems needs to be guided by research that seeks to optimize factors such as timeliness and criteria for alerts, form and context of alerts, cost and equipage considerations, required response to alerts, human factors, and many other elements. The implementation of runway incursion alerting is similar to the development of the Traffic Alert and Collision Avoidance System (TCAS) for airborne operations and requires the same care and consideration for research, development and implementation.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Trajectory Management - Surface Operational Improvments



OI-0333 Improved Operations to Closely Spaced Parallel Runways

Description: Enhanced procedures (including cockpit and ground improvements) enable parallel runway improvements, reducing impact to airport/runway throughput in lower visibility conditions. Maintaining access to closely-spaced parallel runways in limited visibility conditions by integrating new aircraft technologies will ensure safety through precision navigation, aircraft-based monitoring of the aircraft on the parallel approach, and flight guidance to avoid wake vortex generated by parallel traffic. This capability will apply aircraft-based technologies to maintain access in Instrument Meteorological Conditions (IMC), as well as support a new Instrument Flight Rules (IFR) standard for runway spacing. A number of other intermediate concepts for maintaining access to parallel runways continue being explored (e.g., use of Required Navigation Performance (RNP) approaches to define parallel approaches with adequate spacing and visual transition to the runway).

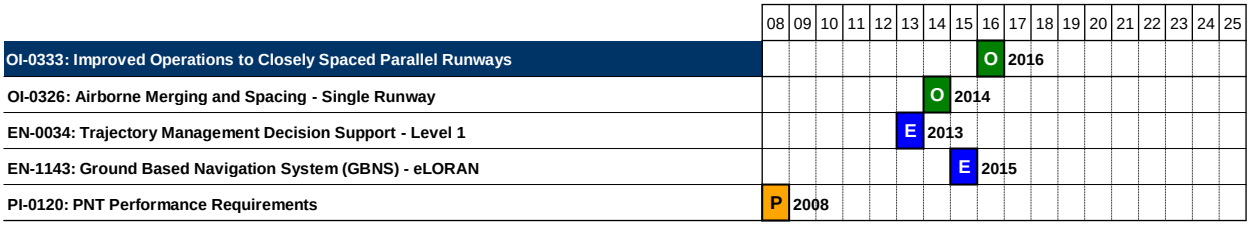
Functional Drivers: This OI seeks Visual Meteorological Condition (VMC) arrival and departure rates in IMC through use of onboard displays and alerting for independent parallel runways. Using precision navigation, cooperative surveillance, and onboard algorithms and displays allows the reduction of lateral separation requirements for parallel runway operations in IMC. Includes independent approaches to parallel runways that are centerline distances greater than 2500 ft. The implementation of this OI is strongly dependent on when an airline decides this is important and steps forward to advocate for it.

SOPR: FAA ***SOPR Unique Reference:*** 102141

SOCR: ***Primary Supported OIs:*** OI-0338

OI Group: Trajectory Management - Arrival/Departure Operational Improvements

Operational Improvement Listing



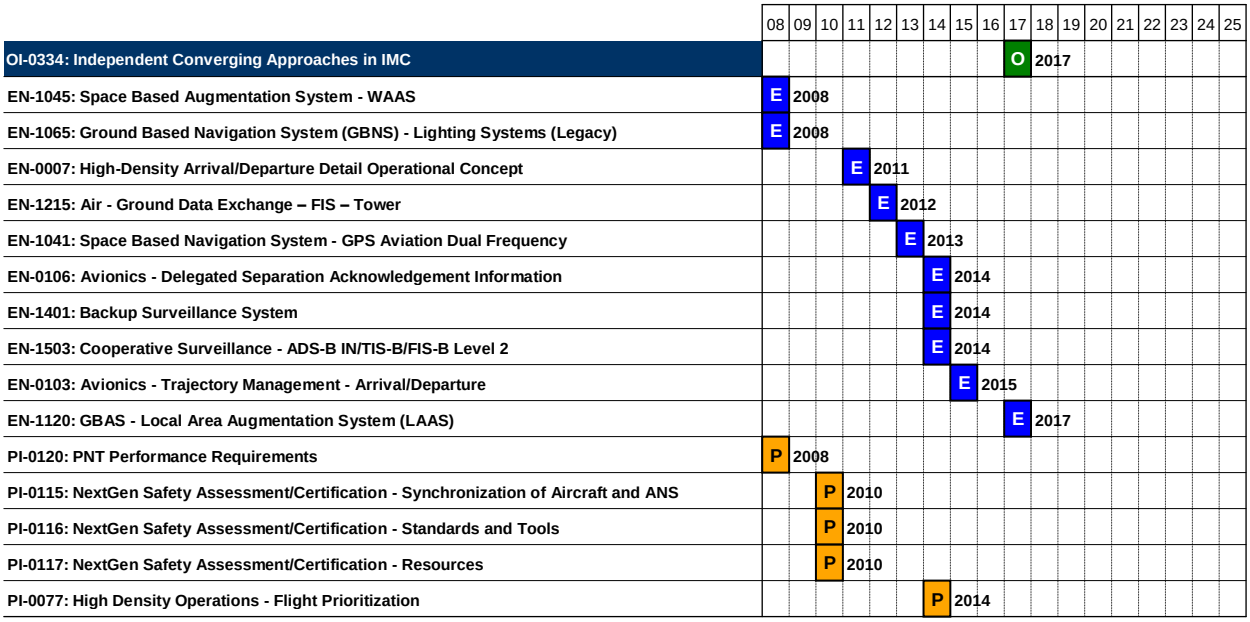
OI-0334 Independent Converging Approaches in IMC

Description: This Operational Improvement (OI) enables maintaining Visual Meteorological Condition (VMC) arrival and departure rates in Instrument Meteorological Conditions (IMC) through use of onboard displays and alerting for independent converging runways. Using precision navigation, cooperative surveillance, and onboard algorithms and displays allows the reduction of lateral separation requirements for converging runway operations in IMC. Includes independent approaches to converging runways that are centerline distances greater than 2500 ft. The implementation of this OI is strongly dependent on when an airline decides this is important and steps forward to advocate for it.

SOPR: FAA ***SOPR Unique Reference:*** 102141

SOCR: ***Primary Supported OIs:*** OI-0338

OI Group: Trajectory Management - Arrival/Departure Operational Improvements



OI-0337 Flow Corridors - Level 1 Static

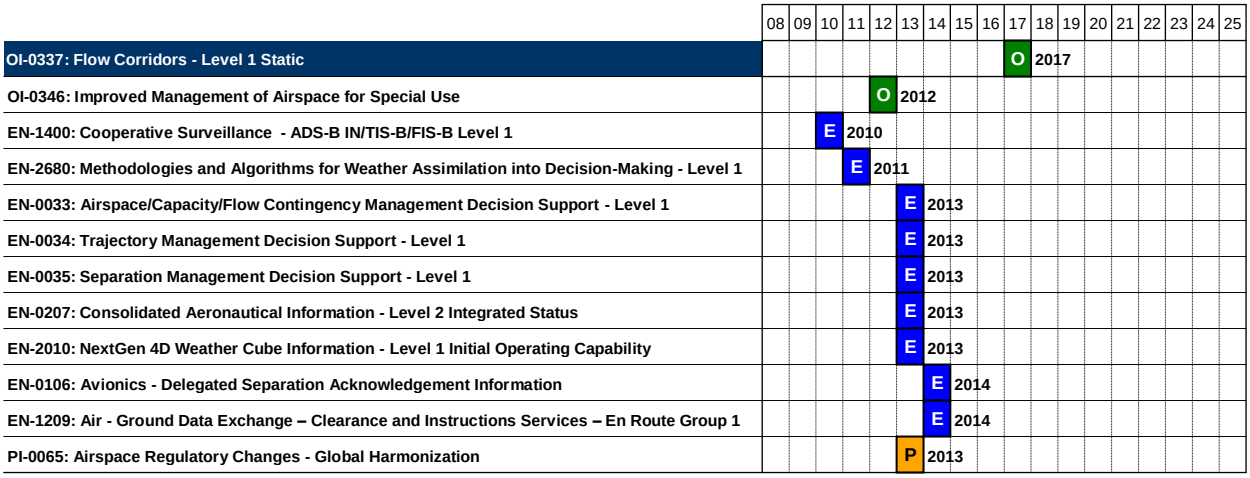
Description: High density En Route static flow corridors accommodate aircraft that are capable of self-separation traveling on similar routes, achieving high traffic throughput by minimizing complexity and crossing traffic. When there are large numbers of suitably equipped aircraft traveling in the same direction on similar routes, the Air Navigation Service Provider (ANSP) may implement flow corridors, which consist of long tubes or "bundles" of parallel lanes. Aircraft within the corridors are responsible for separation from other aircraft (that is, the corridors are self-separation airspace), and use onboard separation capabilities for entering and exiting the corridors, as well as for overtaking, all of which are accomplished with well-defined procedures to ensure safety. Flow corridors efficiently handle very high traffic densities, increasing throughput and increasing the airspace available to other traffic. Flow corridors are procedurally separated from other traffic not in the corridor. Procedures exist to allow aircraft to safely exit the corridor in the event of a declared emergency.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-0339, OI-0365, OI-0406, OI-0368

OI Group: Capacity Management Operational Improvements

Operational Improvement Listing



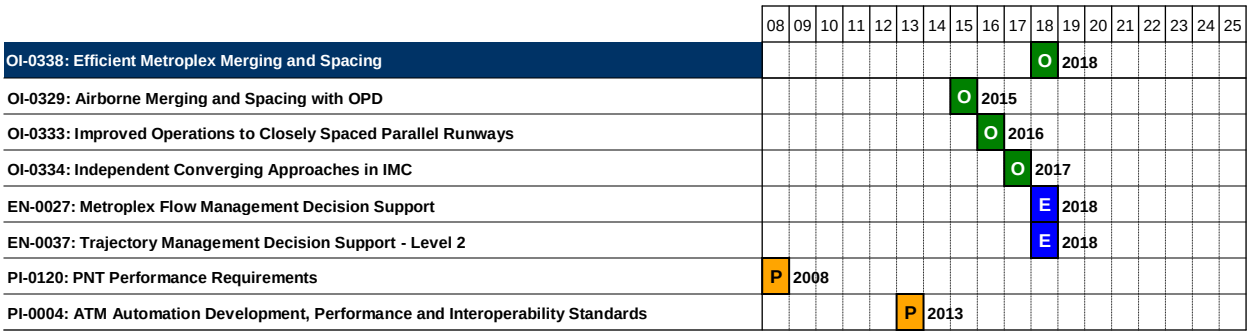
OI-0338 Efficient Metroplex Merging and Spacing

Description: This Operational Improvement (OI) uses airborne merging and spacing to allow greater traffic throughput and reduced Air Navigation Service Provider (ANSP) workload in terminal areas by reducing spacing buffers between streams approaching and departing multiple metroplex runways. This OI includes development of ANSP capability and procedures and requires an Implementation Decision to determine what complex airborne merging and spacing operations will be required for effective use of high-density metroplex airspace, such as crossing streams, merging and diverging streams, etc.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-0339

OI Group: Trajectory Management - Arrival/Departure Operational Improvements



OI-0339 Integrated Arrival/Departure and Surface Traffic Management for Metroplex

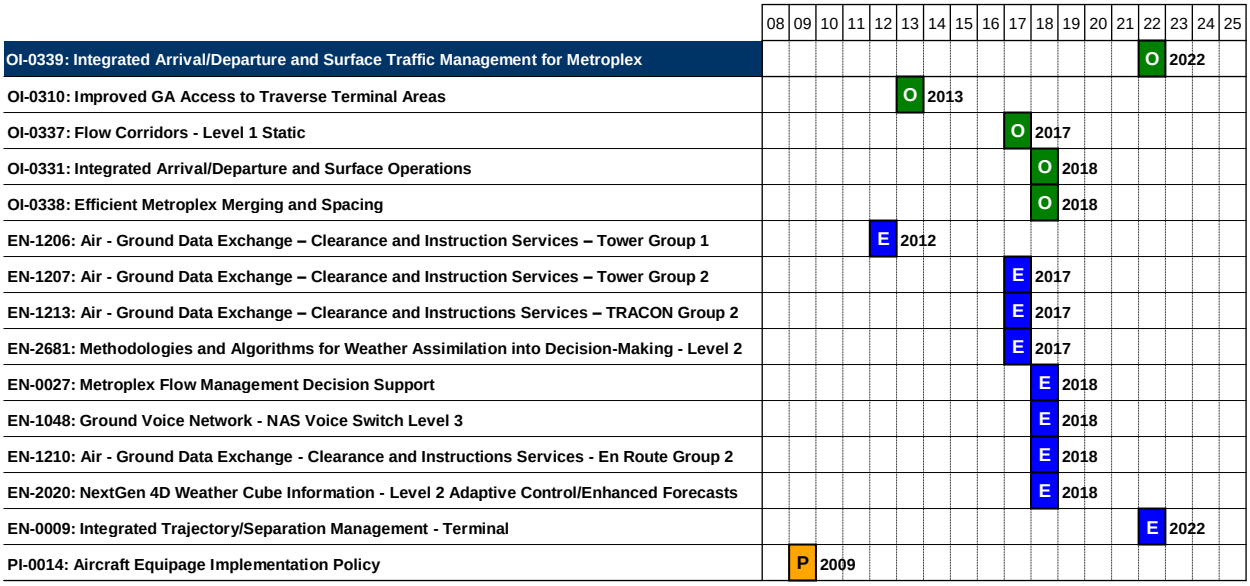
Description: Metroplex traffic flow is more effectively managed through terminal area and surface scheduling automation for increased regional capacity. Metroplex planners at major terminal areas optimize arrival/departure and surface scheduling for increased regional capacity. Trajectory-based operations is a key element of super-density procedures, allowing the Air Navigation Service Provider (ANSP) to maximize access for all traffic, while adhering to the principle of giving advantage to those aircraft with advanced capabilities that support the air traffic management system. Metroplex trajectory management assigns each arriving aircraft to an appropriate runway, arrival stream, and place in sequence.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-0370

OI Group: Trajectory Management - Arrival/Departure Operational Improvements

Operational Improvement Listing



OI-0340 Near-Zero-Visibility Surface Operations

Description: Aircraft and ground vehicle movement on airports in near-zero/zero visibility conditions is guided by technology such as moving map displays, Cockpit Display of Traffic Information (CDTI), enhanced vision sensors, synthetic vision systems, Automatic Dependent Surveillance-Broadcast (ADS-B) (for flight vehicles), and a Ground Support Equipment (GSE) Cooperative Surveillance System (CSS) (for ground vehicles). Requires all present aircraft and ground vehicles to have cooperative surveillance (i.e., ADS-B out). Cost/benefit analysis will determine visibility goal to support. Research issue/policy question: responsibility for all aspects of separation for operator vs. Air Navigation Service Provider (ANSP) and humans vs. automation.

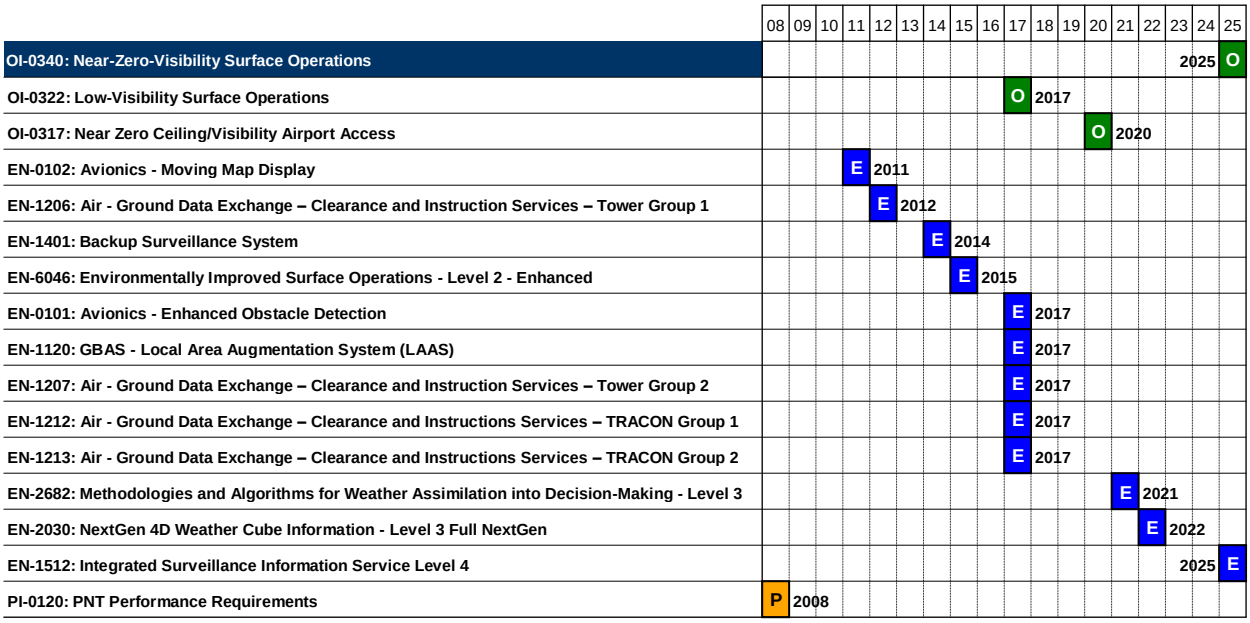
SOPR: FAA

SOPR Unique Reference:

SOCR:

Primary Supported OIs: OI-0370

OI Group: Trajectory Management - Surface Operational Improvments



Operational Improvement Listing

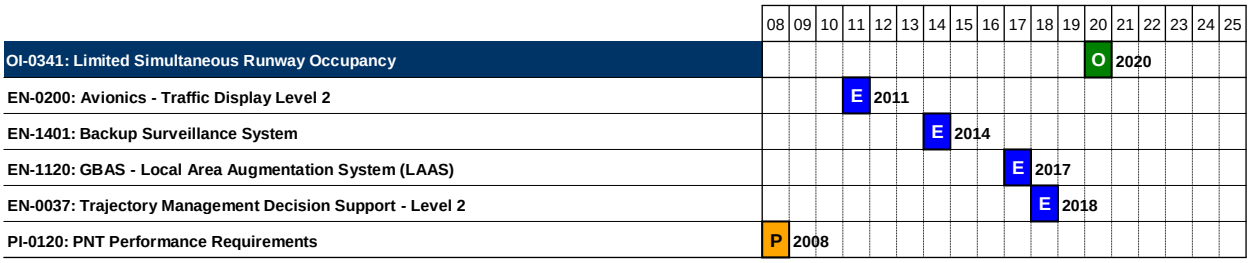
OI-0341 Limited Simultaneous Runway Occupancy

Description: Runway capacity is increased through the allowance of multiple aircraft on the runway for specific situations. Expected use: One aircraft can land while another one is exiting to a taxiway, one aircraft can enter the runway while another aircraft is departing. This operation is routinely used by the military to enable expeditious movement of traffic but does require close cooperation and knowledge of the pilots involved with the operation. One way to enable this operation is by the use and transmission of precision surveillance, very accurate prediction and adherence to 4-Dimensional Trajectory (4DT) (air and ground) and easily accomplished escape procedures. This Operational Improvement requires a Policy Decision. This is highly controversial, but would be transformational and depending on how it is implemented could have a significant impact on runway capacity.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Trajectory Management - Arrival/Departure Operational Improvements



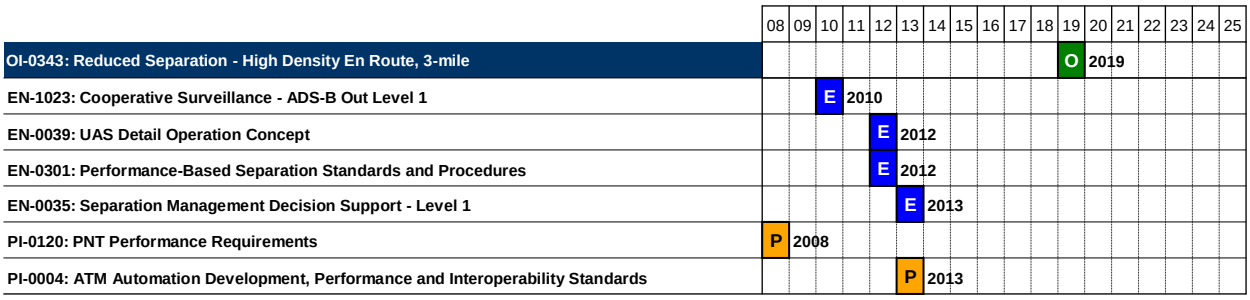
OI-0343 Reduced Separation - High Density En Route, 3-mile

Description: Three-mile separation procedures are applied to new airspace based on Required Surveillance Performance (RSP). This assumes a homogeneous environment (e.g., 3-mile separation becomes the "default" in some airspace). In the future, this constraint may be eliminated through the use of advanced surveillance techniques or technologies, e.g., ADS-B, modern radar processing technologies and/or the use of appropriate RSP procedures and technologies. Expected use: high density integrated arrival/departure flows, and transition from En Route into high density terminal airspace.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-0348

OI Group: Separation Management Operational Improvements



OI-0344 Reduced Oceanic Separation - 30 Miles for Pair-Wise Maneuvers

Description: Availability of user preferred oceanic profiles is increased through reduction of horizontal and longitudinal spacing to 30 miles for pair-wise maneuvers between capable aircraft. Provides increased capacity and improved operational flexibility. The procedures rely on Required Navigation Performance (RNP), satellite-based voice and data communications, and increased Automatic Dependent Surveillance - Contract (ADS-C) update rate.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-0353, OI-0354

OI Group: Separation Management Operational Improvements

Operational Improvement Listing

	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
OI-0344: Reduced Oceanic Separation - 30 Miles for Pair-Wise Maneuvers		O 2009																
EN-0203: Avionics - Traffic Collision and Avoidance System - Level 1	E 2008																	
EN-1700: Cooperative Surveillance - ADS-C	E 2008																	
EN-1750: Radio Data Link: Legacy Satcom	E 2008																	
EN-0201: Avionics - RNP		E 2009																
PI-0014: Aircraft Equipage Implementation Policy		P 2009																
PI-0017: Communications Architecture Plan for Ground, Space, Airborne, and/or		P 2009																

OI-0346 Improved Management of Airspace for Special Use

Description: Airspace use is optimized and managed in real-time, based on actual flight profiles and real-time operational use parameters. Airspace reservations for military operations, unmanned aircraft system flights, space flight and re-entry, restricted or warning areas, and flight training areas are managed on an as-needed basis. Enhanced automation-to-automation communications and collaboration enables decision-makers to dynamically manage airspace for special use, increasing real-time access and use of unused airspace. This will enable Air Navigation Service Provider (ANSP) decision-support tools, integrated with automation-to-automation flight planning, to have increased access and improved coordination of airspace use. Flight deck automation is enhanced to include data communications capabilities and to recognize Special Use Airspace (SUA)-encoded data. The SUA status is available via uplink to the cockpit in graphical and automation-readable form, supporting pre-flight and in-flight planning.

Functional Drivers: This OI facilitates improved utilization of airspace when not in use by military or other scheduled users. Users may access airspace status and schedule information by subscribing to a service or directly with the ANSP. Implementation includes modifications to the Special Use Airspace Management automation and conflict probe to detect potential airspace issues.

SOPR: DOD ***SOPR Unique Reference:*** 108212

SOCR: ***Primary Supported OIs:*** OI-0365, OI-0406, OI-0351, OI-0337

OI Group: Capacity Management Operational Improvements

	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
OI-0346: Improved Management of Airspace for Special Use					O 2012													
EN-0170: SUA Management Decision Support - Level 1		E 2009																
EN-0206: Consolidated Aeronautical Information - Level 1 Network-Enabled Legacy				E 2011														
PI-0024: Secure Information Exchange	P 2008																	
PI-0108: Certifying Use of Net-Centric Information	P 2008																	
PI-0008: General Aviation Benefits			P 2010															

OI-0347 Air Traffic Control Surveillance Service in Non-Radar Areas (ADS-B)

Description: The air navigation service provider (ANSP) automation uses automatic dependent surveillance broadcast in non-radar airspace to provide reduced separation and flight following. Improved surveillance enables ANSP to use radar-like separation standards and services. The Automatic Dependent Surveillance - Broadcast (ADS-B) positional reports are incorporated into the surveillance data processing systems and displayed to the controller. This allows ANSP to apply lower separation minima allowing for improved access and more efficient flight paths.

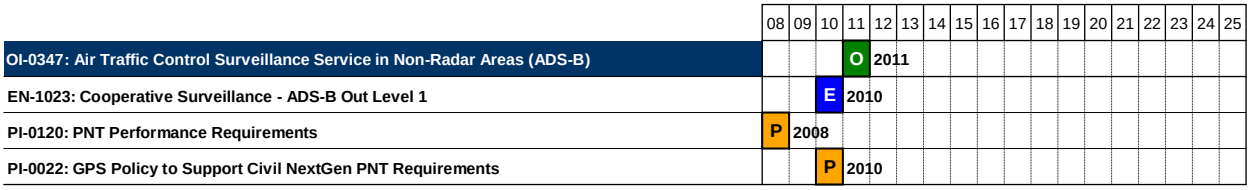
Functional Drivers: There are a significant number of non-radar areas in the domestic airspace where surveillance-based separation standards and/or delegated separation might be employed in place of less efficient route separation. With the implementation of ADS-B, 5 mile separation procedures are used in some airspace, such as specific oceanic regions, to provide increased capacity and greater operational flexibility. It is intended for implementation in the Gulf of Mexico or other busy areas of non-radar airspace close to shore.

SOPR: FAA ***SOPR Unique Reference:*** 102123

SOCR: ***Primary Supported OIs:*** OI-0356

OI Group: Separation Management Operational Improvements

Operational Improvement Listing



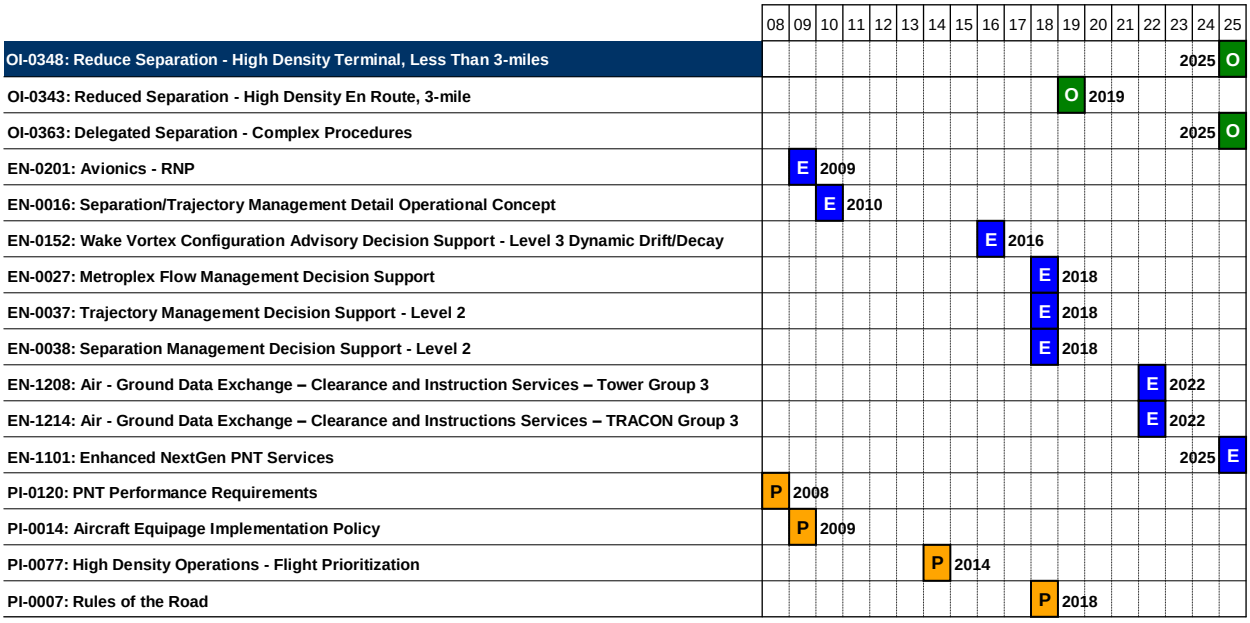
OI-0348 Reduce Separation - High Density Terminal, Less Than 3-miles

Description: Metroplex airspace capacity is increased through implementing separation standards of less than 3 miles between high navigation precision arrival and departure routes. This Operational Improvement increases metroplex airspace capacity and supports super density airport operations by implementing separation standards for inter-aircraft separations of less than 3 miles. Arrival/departure routes with lower Required Navigation Performance (RNP) values (e.g., RNP<1 nm) are defined with less than 3 miles lateral separation between routes, subject to wake vortex constraints, enabling the use of more routes in a given airspace. This may require airborne lateral separation between routes. Enhanced Required Surveillance Performance (RSP) is required. This requires a Policy Decision to determine what RNP values to require based on performance benefit versus equipage requirements and operational considerations. Expected use: high density terminal and transition airspace.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Separation Management Operational Improvements



OI-0349 Automation Support for Mixed Environments

Description: The Air Navigation Service Provider (ANSP) automation provides the controller with tools to manage aircraft in a mixed navigation and wake performance environment. Aircraft with various operating and performance characteristics will be operating within the same volume of airspace. Controllers will use ANSP automation enhancements to provide situational awareness of aircraft with advanced capabilities (e.g., delegated self-separation maneuvers, equipped vs. non-equipped aircraft, Area Navigation [RNAV], Required Navigation Performance [RNP], and trajectory flight data management). These enhancements enable ANSP to manage the anticipated increase in complexity and volume of air traffic.

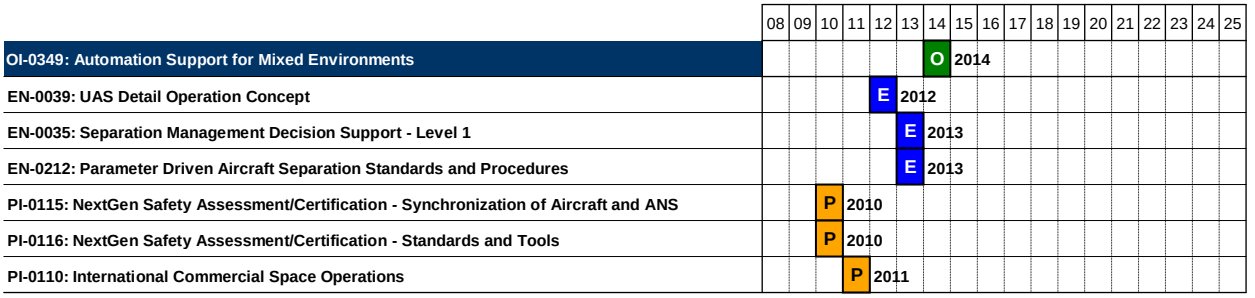
Functional Drivers: The separation standards used in mixed use airspace will be enhanced to accommodate new larger aircraft and Unmanned Aircraft Systems (UASs). The separation standards including wake turbulence requirements will be incorporated into ANSP automation providing support for efficiently managing parameter-driven separation, and requires development of standards and procedures.

SOPR: FAA ***SOPR Unique Reference:*** 102137

SOCR: ***Primary Supported OIs:***

OI Group: Separation Management Operational Improvements

Operational Improvement Listing



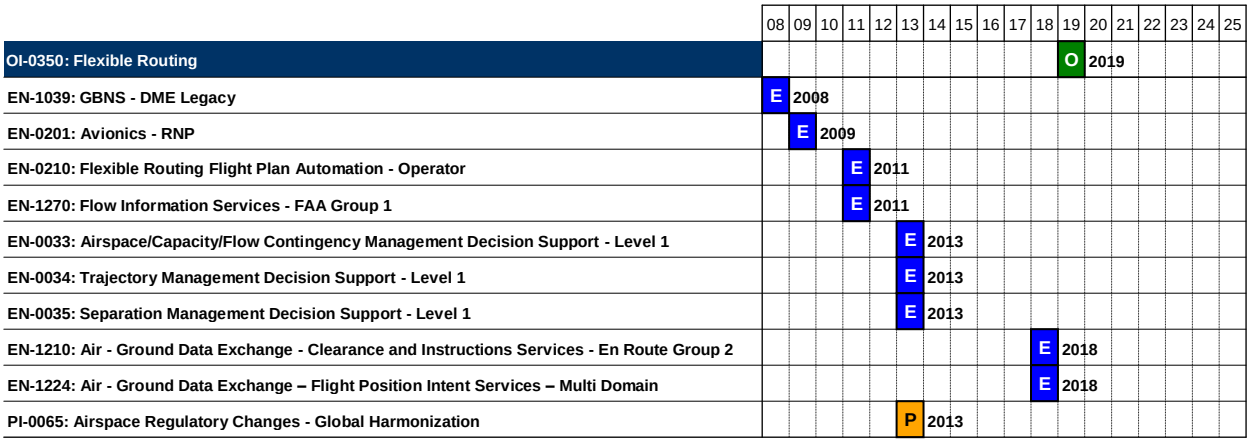
OI-0350 Flexible Routing

Description: Equipped aircraft are not restricted to pre-defined routes except when Air Navigation Service Provider (ANSP) requires more structure. Aircraft may execute a desired route using existing fixed waypoints or other route coordinates. Aircraft may change that route at any time within the confines of proper separation management and coordination of route changes with ANSP through data or voice communications. Air-ground data exchange mechanisms will maintain route awareness with relevant ANSP facilities. The ANSP uses ground-based decision support tools (e.g., conflict probe) to maintain separation of aircraft flying on flexible routes. Structure is imposed as needed for congestion management. This supports the ability for operators to fly wherever desired; operators can file any route desired except where demand requires that structure be imposed.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-4502

OI Group: Capacity Management Operational Improvements



OI-0351 Flexible Airspace Management

Description: Air Navigation Service Provider (ANSP) automation supports reallocation of trajectory information, surveillance, communications, and display information to different positions or different facilities. The ANSP moves controller capacity to meet demand. Automation enhancements enable increased flexibility to change sector boundaries and airspace volume definitions in accordance with pre-defined configurations. The extent of flexibility has been limited due to limitations of automation, surveillance, and communication capabilities, such as primary and secondary radar coverage, availability of radio frequencies, and ground-communication lines. New automated tools will define and support the assessment of alternate configurations as well as re-mapping of information (e.g., flight and radar) to the appropriate positions.

SOPR: FAA ***SOPR Unique Reference:*** 108206

SOCR: ***Primary Supported OIs:*** OI-0307, OI-0365, OI-4511

OI Group: Capacity Management Operational Improvements

Operational Improvement Listing

	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
OI-0351: Flexible Airspace Management								O 2015										
OI-0346: Improved Management of Airspace for Special Use					O 2012													
EN-2680: Methodologies and Algorithms for Weather Assimilation into Decision-Making - Level 1				E 2011														
EN-1036: Ground Voice Network - NAS Voice Switch Level 1					E 2012													
EN-0033: Airspace/Capacity/Flow Contingency Management Decision Support - Level 1						E 2013												
EN-0034: Trajectory Management Decision Support - Level 1						E 2013												
EN-0207: Consolidated Aeronautical Information - Level 2 Integrated Status						E 2013												
EN-2010: NextGen 4-D Weather Cube Information - Level 1 Initial Operating Capability						E 2013												
PI-0065: Airspace Regulatory Changes - Global Harmonization						P 2013												

OI-0352 Automated Clearance Delivery and Frequency Changes

Description: Controller productivity enhanced through En Route data link communication of Air Traffic Control (ATC) clearances and frequency handoffs to pilot.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Trajectory Management - En Route/Multi-Domain Operational Improvements

	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
OI-0352: Automated Clearance Delivery and Frequency Changes							O 2014											
EN-1209: Air - Ground Data Exchange – Clearance and Instructions Services – En Route Group 1							E 2014											

OI-0353 Reduced Oceanic Separation - Altitude Change Pair-Wise Maneuvers

Description: Availability of user preferred oceanic profiles for capable aircraft is increased through pair-wise altitude change maneuvers with ground-based separation responsibility. Aircraft-to-aircraft oceanic longitudinal and lateral spacing is reduced to 10 miles during altitude change maneuver. Pair-wise maneuvers (in-trail climbs and descents) are enabled through the use of improved oceanic cooperative surveillance information. This may be implemented using either 1) Automatic Dependent Surveillance-Contract (ADS-C) and satellite-based communication, or 2) Automatic Dependent Surveillance-Broadcast (ADS-B), on-board displays and algorithms, and satellite-based communications.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-0359

OI Group: Separation Management Operational Improvements

	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
OI-0353: Reduced Oceanic Separation - Altitude Change Pair-Wise Maneuvers							O 2014											
OI-0344: Reduced Oceanic Separation - 30 Miles for Pair-Wise Maneuvers		O 2009																
EN-0202: Avionics - Traffic Display Level 1 Cockpit Display of Traffic Information (CDTI)	E 2008																	
EN-1750: Radio Data Link: Legacy Satcom	E 2008																	
EN-0201: Avionics - RNP		E 2009																
EN-0035: Separation Management Decision Support - Level 1						E 2013												
EN-0106: Avionics - Delegated Separation Acknowledgement Information							E 2014											
EN-0168: In-Trail Oceanic Separation Using ADS-C							E 2014											
EN-0169: In-Trail Oceanic Separation Using ADS-B							E 2014											
PI-0012: Surveillance - Global Harmonization			P 2010															
PI-0022: GPS Policy to Support Civil NextGen PNT Requirements			P 2010															

Operational Improvement Listing

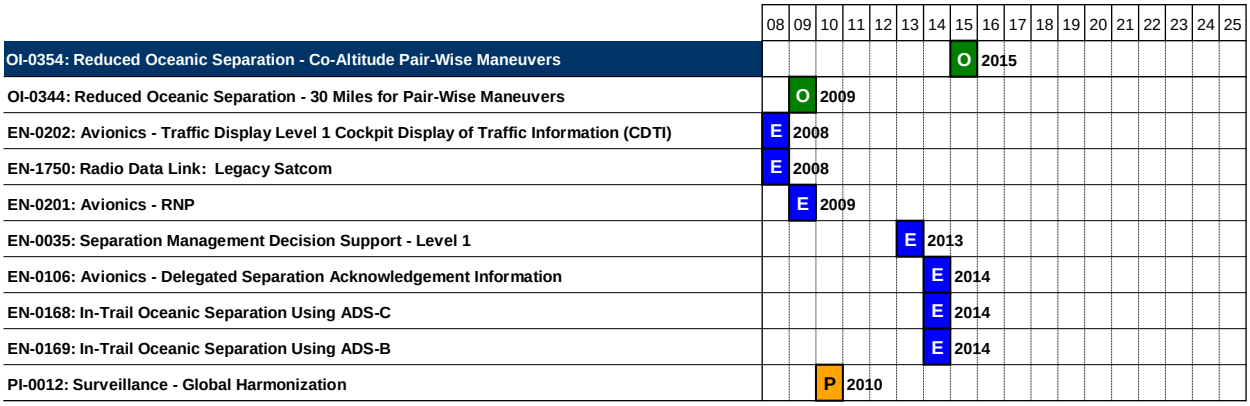
OI-0354 Reduced Oceanic Separation - Co-Altitude Pair-Wise Maneuvers

Description: Availability of user preferred oceanic profiles is further increased through reduction of horizontal spacing to below 30 miles for pair-wise co-altitude maneuvers between capable aircraft. Co-altitude maneuvers, such as passing a similar-speed aircraft, have much longer risk exposure times than altitude change maneuvers, resulting in higher collision risk, so communication uncertainties play a significant role in defining safe separation standards. With Implementation Alternative 1, Automatic Dependent Surveillance-Contract (ADS-C) and ground-based separation assurance, the goal is 15 miles. With Implementation Alternative 2 (Automatic Dependent Surveillance-Broadcast [ADS-B] and delegated separation for the pair-wise maneuver), the goal is 3-5 miles. Benefit is to provide increased capacity and improved operational flexibility. The procedures rely on RNP, satellite-based voice and data communications, and either 1) increased ADS-C update rate or 2) ADS-B. Major Implementation Alternatives: a) ADS-C surveillance information and ground-based separation assurance b) ADS-B and delegated separation for pair-wise maneuvers.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-0359

OI Group: Separation Management Operational Improvements



OI-0355 Delegated Responsibility for Horizontal Separation

Description: Enhanced surveillance and new procedures enable the Air Navigation Service Provider (ANSP) to delegate aircraft-to-aircraft separation. Improved display avionics and broadcast positional data provide detailed traffic situational awareness to the flight deck. When authorized by the controller, pilots will implement delegated separation between equipped aircraft using established procedures. Broadcast surveillance sources and improved avionics capabilities provide ANSP and the flight deck with accurate position and trajectory data. Aircraft that are equipped to receive the broadcasts and have the associated displays, avionics, and crew training are authorized to perform delegated separation when recommended by the controller. Delegated separation operations include separation authority for a specific maneuver (e.g., in-trail arrival). For aircraft not delegated separation authority, ANSP automation still manages separation. Aircraft perfiorming delegated separation procedures separate themselves from one another.

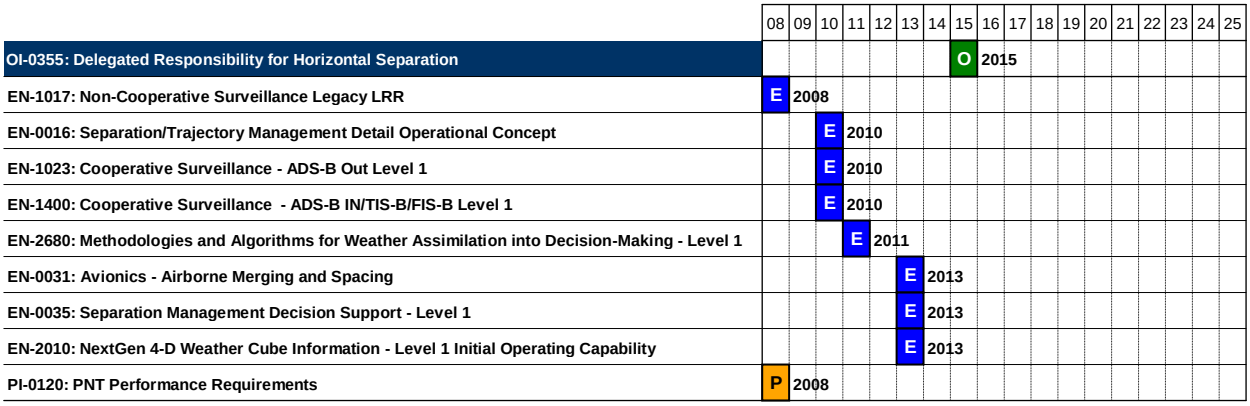
Functional Drivers: This delegated maneuver can reduce ANSP workload and increase traffic flow in constrained airspace.

SOPR: FAA ***SOPR Unique Reference:*** 102118

SOCR: ***Primary Supported OIs:***

OI Group: Separation Management Operational Improvements

Operational Improvement Listing



OI-0356 Delegated Separation - Pair-Wise Maneuvers

Description: In Air Navigation Service Provider (ANSP)-managed airspace, the ANSP delegates separation responsibility for specific pair-wise maneuvers to capable aircraft for the purposes of improving operator routing, enhancing operational efficiency, or increasing ANSP productivity. The ANSP delegates responsibility to capable aircraft to perform specific separation operations. This includes passing, crossing, turn-behind, and other simple separation tasks that require onboard display of traffic information. This does not include complex separation situations that would require onboard conflict alerting. The ANSP is responsible for separation from all other traffic while the designated aircraft performs the specified maneuver.

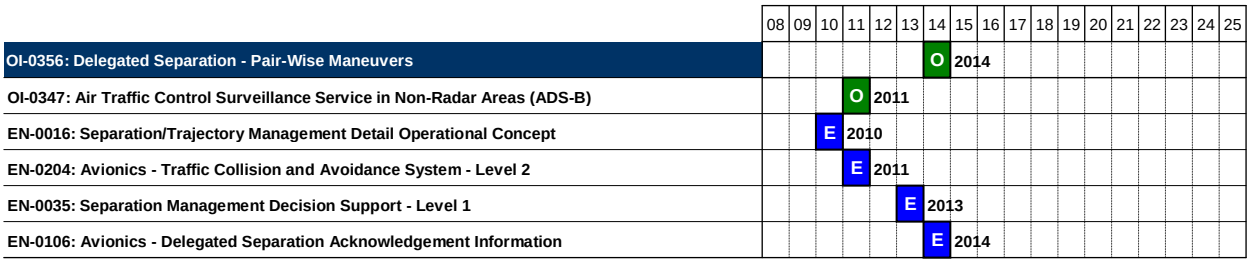
SOPR: FAA

SOPR Unique Reference:

SOCR:

Primary Supported OIs: OI-0362, OI-0363, OI-0359

OI Group: Separation Management Operational Improvements



Operational Improvement Listing

OI-0358 Trajectory Flight Data Management

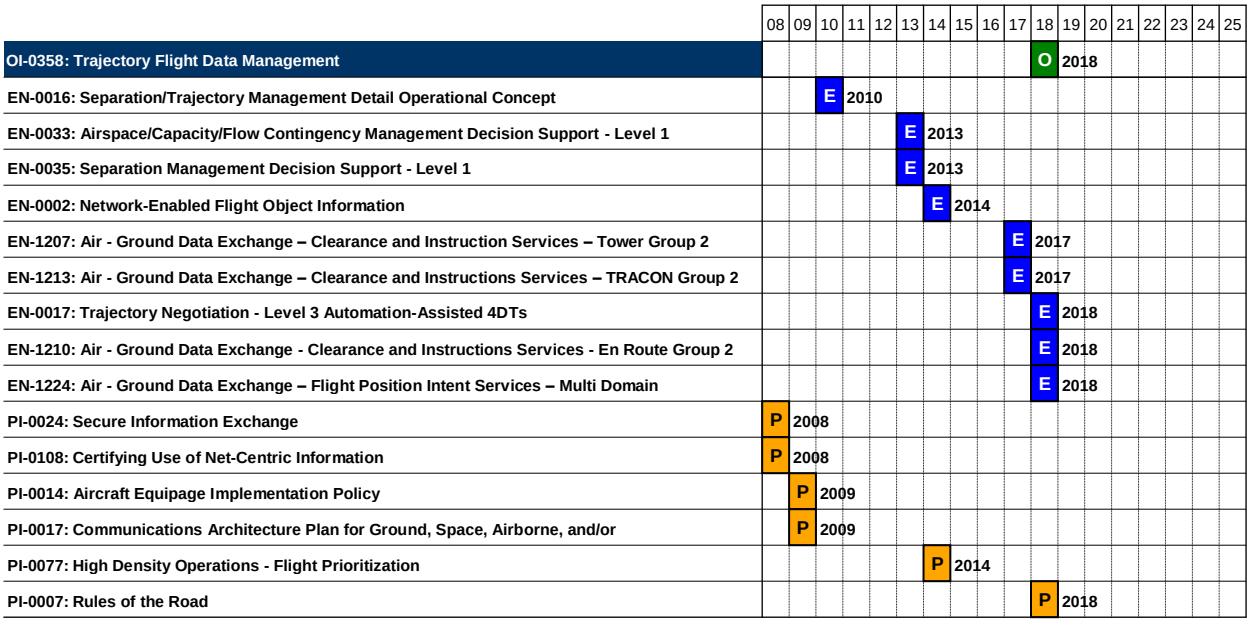
Description: In trajectory flight data management, there will be complete end-to-end management of the flight from pre-flight to post analysis. Flight planning and filing will be supported up to flight departure. This will replace reliance on OAG for future schedules and historical routing to identify potential flight profiles and will provide information commensurate with development of longer-term strategic flow initiatives. Further, by filing early, the user will receive updates until departure date, identifying changes in constraint status, and permitting early reevaluation and replanning of the flight. This will include restrictions for special events or planned NAS outages. The flight plan management system will use "volumes of interest" to determine the relationship of the projected trajectory and the interest of service providers. This will support the separation assurance and the advisory services through more flexible distribution of flight data, the automatic generation of point-outs and the coordination functions for control of aircraft. This move to volumes will also mean that the flight data management system can support user preference from runway-to-runway without requiring any fixed-routing segments for processing. The flight data processing system will increasingly incorporate flight data information provided by the flight deck into the trajectory and conformance modeling, improving the support to service-provider and decision-support tools. All flight plans will be treated as trajectories with protected volumes. This will allow greater use of variable separations and support not only military operations but the operations of other vehicles, such as Remotely-Operated Aircraft (ROA) and Reusable Launch Vehicles (RLVs). Finally, there will be a change in the "ownership" of the active profile. Changes to flight profiles beyond the window of the tactical service providers will be negotiated with a strategic planner and updated without requiring tactical service-provider involvement. This will reduce the workload on the tactical-provider while placing responsibility in the hands of strategic-flow, ensuring change will be consistent with current flow objectives.

Functional Drivers: Precise 4DTs will be used to reduce the uncertainty of an aircraft's planned flight path, in terms of predicted spatial position (latitude, longitude, and altitude) as well as times along points in its path. This enhances the capacity and throughput of the airspace to accommodate high levels of demand and allows the user to alter the predefined trajectory to meet operator preferences when traffic conditions allow.

SOPR: FAA ***SOPR Unique Reference:*** 101202

SOCR: ***Primary Supported OIs:*** OI-0360, OI-4502

OI Group: Trajectory Management - En Route/Multi-Domain Operational Improvements



Operational Improvement Listing

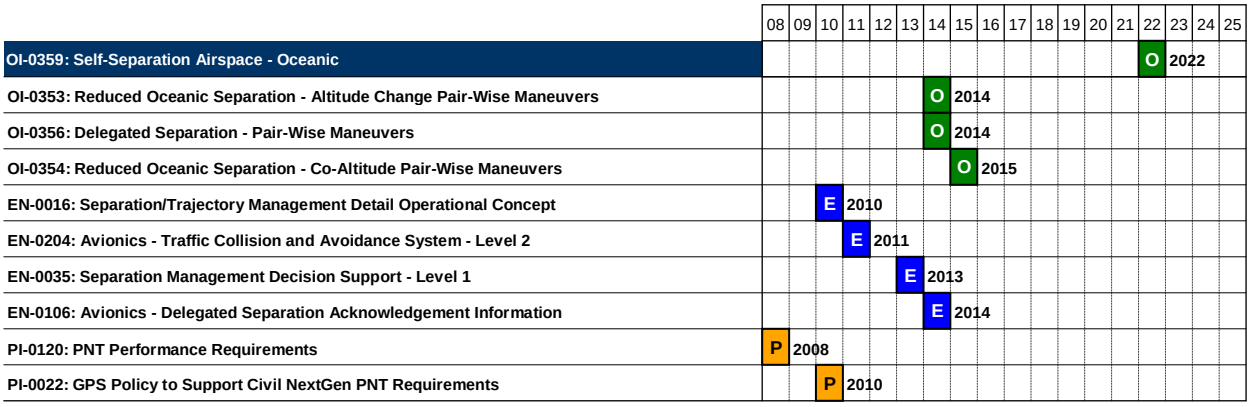
OI-0359 Self-Separation Airspace - Oceanic

Description: Oceanic user efficiency and Air Navigation Service Provider (ANSP) productivity are improved through self-separation operations in designated oceanic airspace for capable aircraft. Aircraft-to-aircraft separation is delegated to the flight deck in designated airspace, such as on designated oceanic tracks, for capable aircraft with Automatic Dependent Surveillance-Broadcast (ADS-B) and onboard conflict detection and alerting.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Separation Management Operational Improvements



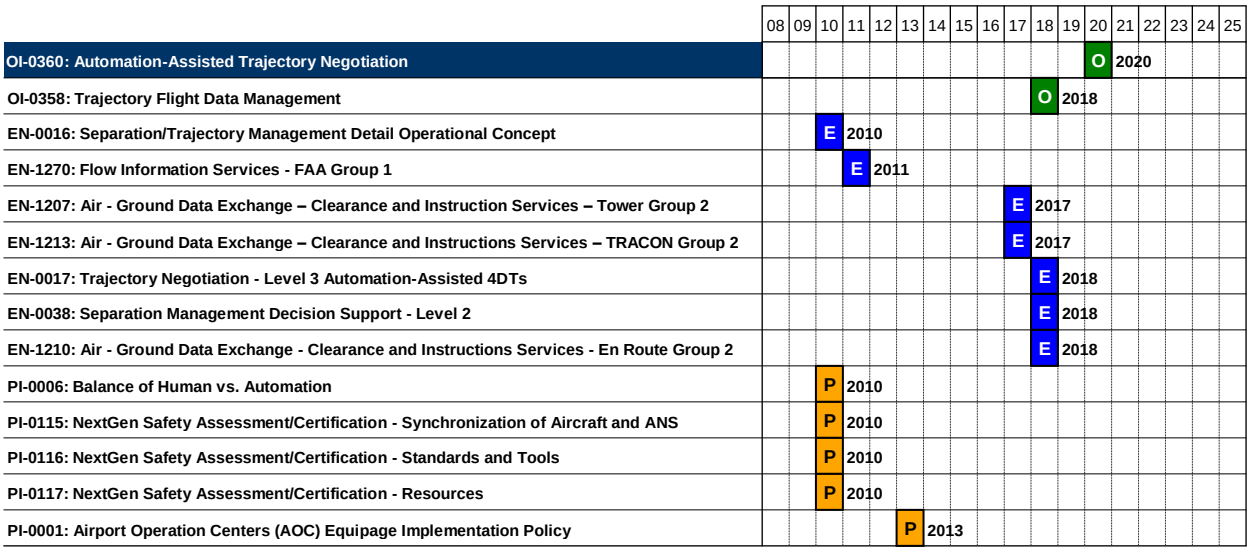
OI-0360 Automation-Assisted Trajectory Negotiation

Description: Trajectory management is enhanced by automated assistance to negotiate with properly equipped aircraft operators. Human Air Navigation Service Providers (ANSPs) are responsible for separation management, supported by automation. Four-Dimensional Trajectories (4DTs) are negotiated between the ground-based automation and the operator, which may be the pilot, a Unmanned Aircraft System (UAS) operator, or perhaps even Flight Operations Center (FOC) personnel, who would then relay information to the aircraft. This will enable higher density of operations thus higher capacity as well as decrease human errors in trajectory negotiation and entry.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-0369

OI Group: Trajectory Management - En Route/Multi-Domain Operational Improvements



Operational Improvement Listing

OI-0361 Resource Planning

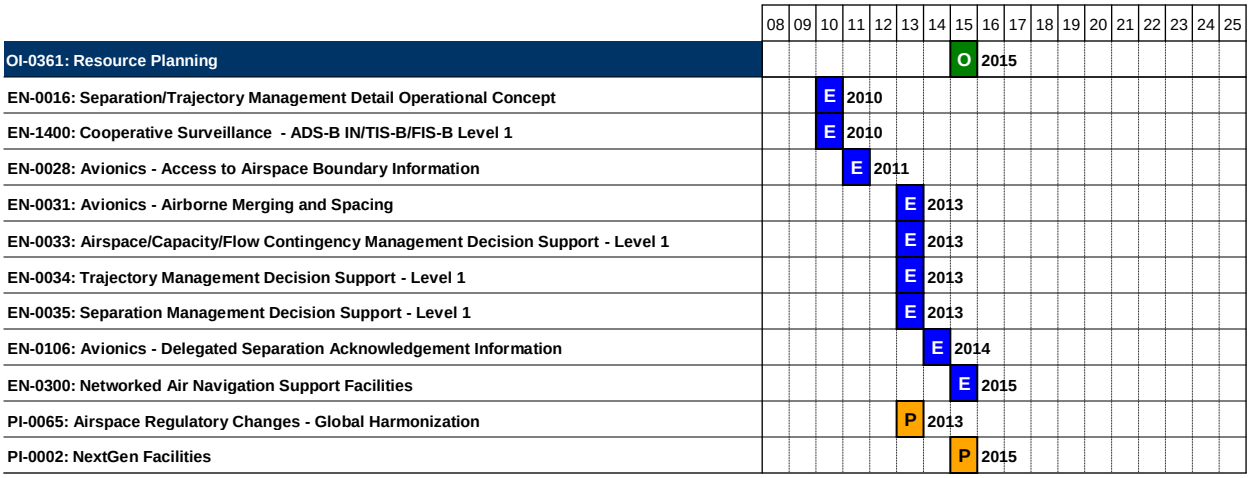
Description: The Air Navigation Service Provider (ANSP) adjusts sectors and resources to meet anticipated demand, promoting efficiency and ensuring safety by strategically mitigating the risk of chronic sector level demand and capacity imbalances. This includes proactively adjusting airspace and resource scheduling based on projections of shift in demand due to seasonal changes, as well as city pair business adjustments by National Airspace System (NAS) users. Enhancements to sector demand prediction are derived from anticipated demand. Sector planning is accomplished using flight day management and forecast demand. Sector-level and NAS-wide planning determines aggregate NAS level demand and capacity needs. ANSP resources and airspace are adjusted to meet anticipated demand. Strategic decision support tools model and analyze the effect of changes and develop trend analysis, validating the planning process. ANSP and affected stakeholders use decision support tools to achieve consensus on projected sector throughput, once modeling efforts have been accomplished and analyzed. Long-term capacity planning is accomplished in collaboration with operators. Long-term capacity management is cognizant of, accounts for, and reconciles with airport planning, safety management, security, and environmental impacts. Long-term capacity management generally requires from months to several years to implement.

Functional Drivers: Management of en route and terminal airspace is optimally allocated across ANSP facilities to provide ANSP cost reduction and productivity improvement. Delivery of services is not tied to the geographic location of the flight operator or the aircraft. ANSP personnel have the ability to acquire needed information and communicate with flight operators independent of their facility location. This OI also reduces the static assignment of airspace.

SOPR: FAA ***SOPR Unique Reference:*** 105102

SOCR: ***Primary Supported OIs:*** OI-0406, OI-0366, OI-0368

OI Group: Capacity Management Operational Improvements



OI-0362 Self-Separation Airspace Operations

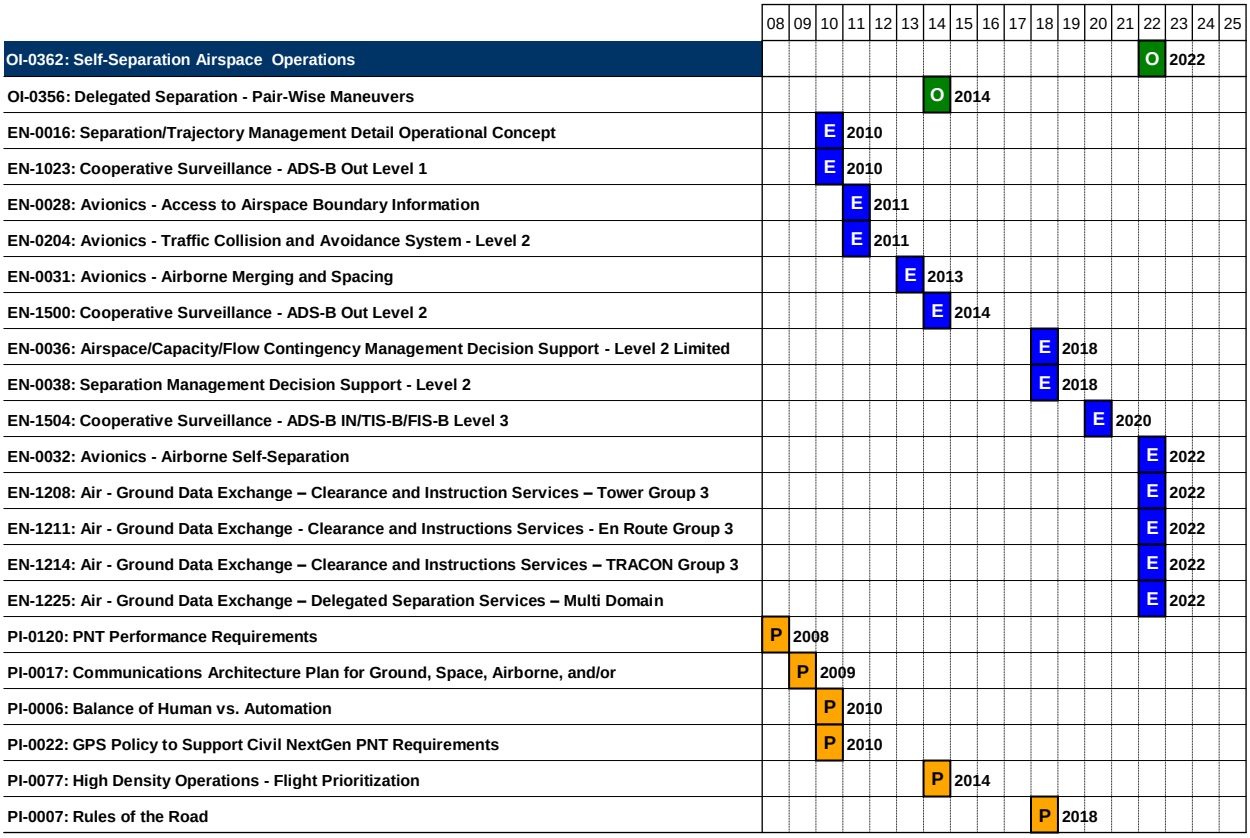
Description: In self-separation airspace, capable aircraft are responsible for separating themselves from one another, and the Air Navigation Service Provider (ANSP) provides no separation services, enabling preferred operator routing with increased ANSP productivity. Research will determine whether the ANSP will provide any traffic flow management services within self-separation airspace. Aircraft must meet equipage requirements to enter self-separation airspace, including transmission of trajectory intent information through cooperative surveillance. Transition into self-separation airspace includes an explicit hand-off and acceptance of separation responsibility by the aircraft. Transition into ANSP-managed airspace is facilitated through assigned waypoints with Controlled Time of Arrivals (CTAs), allowing the ANSP to sequence and schedule entry into congested airspace, and self-separating aircraft are responsible for meeting assigned CTAs. Self-separating aircraft execute standardized algorithms to detect and provide resolutions to conflicts. Right-of-way rules determine which aircraft should maneuver to maintain separation when a conflict is predicted. Contingency procedures ensure safe separation in the event of failures and operational errors.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Separation Management Operational Improvements

Operational Improvement Listing



OI-0363 Delegated Separation - Complex Procedures

Description: In Air Navigation Service Provider (ANSP)-managed airspace, the ANSP delegates separation responsibilities to capable aircraft to improve operator routing, enhance operational efficiency, or increase ANSP productivity. This Operational Improvement involves more complex delegated separation responsibilities that may be supported in ANSP-managed En Route and transition airspace. After early concept exploration and feasibility research, an implementation decision will be made by 2015 to determine whether it is cost beneficial to develop additional delegated separation responsibilities in ANSP-managed airspace beyond those covered in OI-0356 taking advantage of advanced airborne technologies, such as conflict detection and alerting.

SOPR: FAA

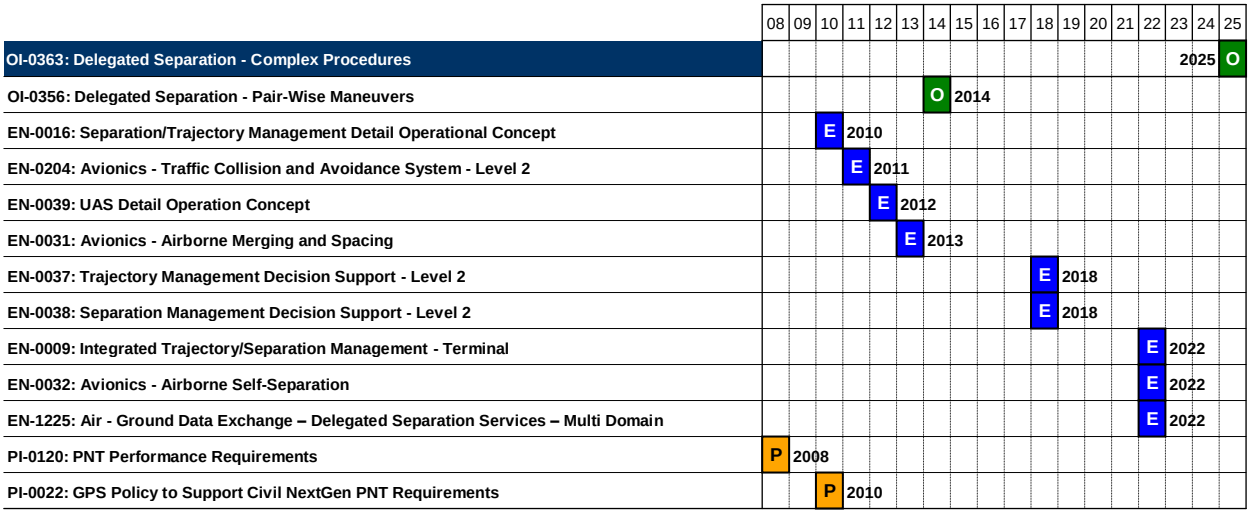
SOPR Unique Reference:

SOCR:

Primary Supported OIs: OI-0348

OI Group: Separation Management Operational Improvements

Operational Improvement Listing



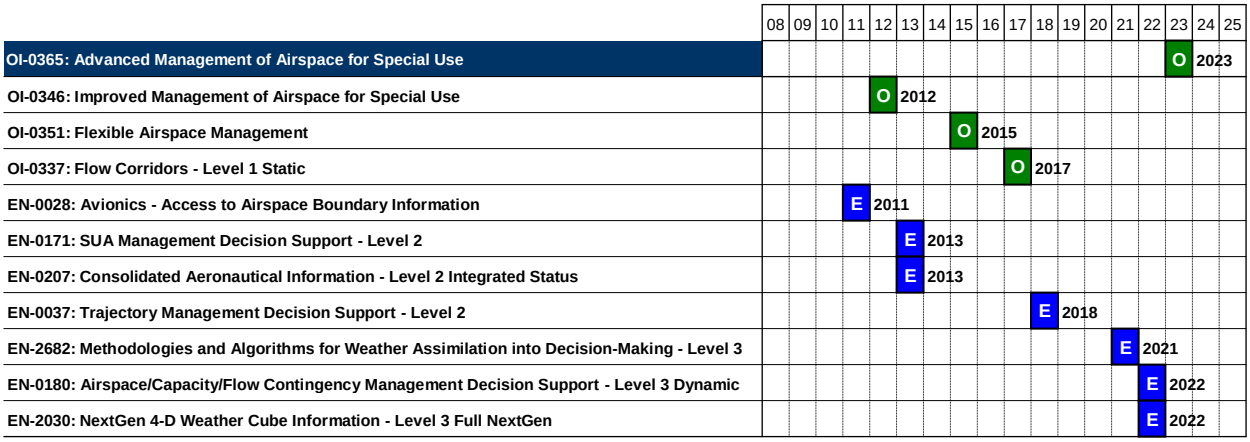
OI-0365 Advanced Management of Airspace for Special Use

Description: Access to airspace is enhanced through more advanced automated real-time scheduling and dynamic status updates of Temporary Flight Restrictions (TFR) and Special Use Airspace (SUA). This facilitates daily negotiations between the Air Navigation Service Provider (ANSP) and military operators to determine an effective strategy that meets military operational requirements while minimizing the impact on traffic flows. Military operators may release Special Use Airspace (SUA) to the ANSP and or agree to adjust boundaries or the time of use to accommodate other users, thereby optimizing the use of airspace resources whenever the airspace is not required to satisfy military airspace requirements/operations. These negotiations and active management will allow the military and the ANSP to update schedules and provide dynamic availability of the airspace for other users. The philosophy for airspace restrictions is to provide the maximum available airspace to all users at all times, meet national security needs via priority 4DT reservations, and facilitate immediate user notification of real-time requests for restricted or SUA. Airspace boundaries may still be chosen from a set of fixed configurations, or it may be adjusted dynamically.

SOPR: DOD ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-4512

OI Group: Capacity Management Operational Improvements



Operational Improvement Listing

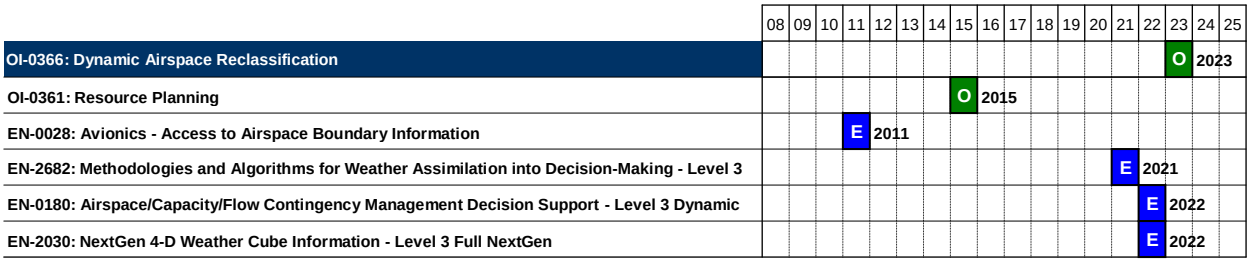
OI-0366 Dynamic Airspace Reclassification

Description: Airspace is dynamically reclassified to meet demand requirements and minimize impacts of adverse weather. Reclassification is executed by providing real-time airspace classification to users during preflight and airborne operations. Temporary Flight Restrictions (TFR) and Special Use Airspace (SUA) when not required by the military are factored into the dynamic reclassification process. An example of reclassification is changing the designation of an airspace from "Classic" to "Trajectory-Based Operations (TBO)" for a particular time period. Aircraft will be required to achieve the appropriate level of navigation performance. This may be a routinely scheduled change or it may be made dynamically in response to forecast demand. This would require the development of rules and operational procedures for reclassification as well as the preconfigured airspace classifications. This Operational Improvement affects flight planning, and may affect aircraft already airborne.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-0368

OI Group: Capacity Management Operational Improvements



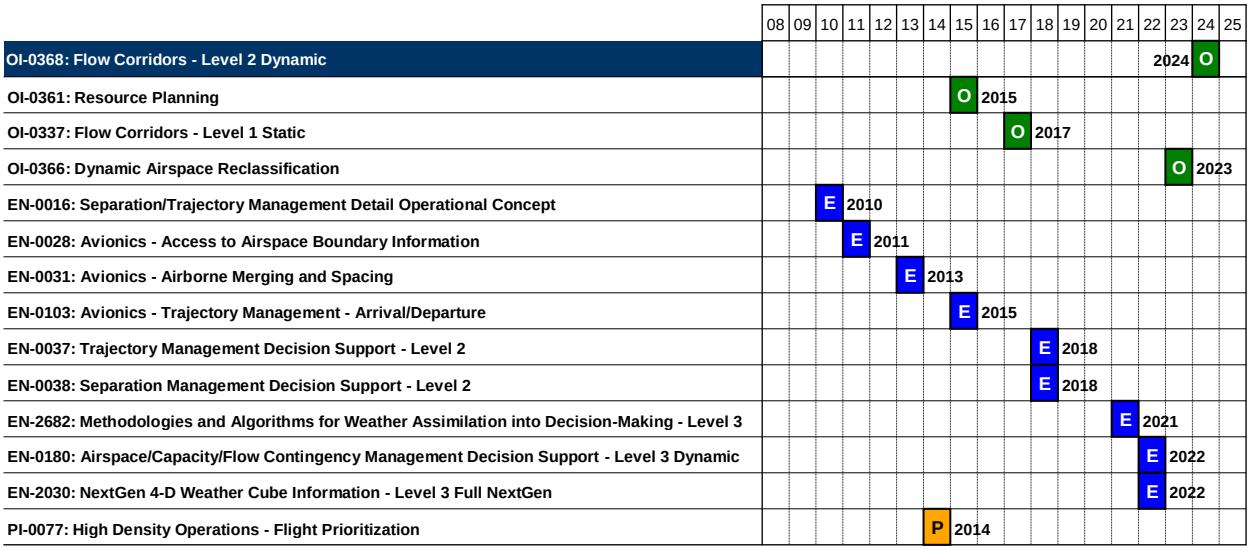
OI-0368 Flow Corridors - Level 2 Dynamic

Description: High density En Route dynamic flow corridors accommodate aircraft that are capable of self-separation traveling on similar wind-efficient routes or through airspace restricted by convective weather cells, Special Use Airspace (SUA), or overall congestion. Dynamic high density flow corridors are defined daily and shifted throughout the flight day to avoid severe weather regions and airspace restrictions (e.g., SUA) or take advantage of favorable winds. Dynamic corridor entry and exit points are also defined. This extends static flow corridor technology (see OI-0361) via dynamic airspace design capabilities to provide more En Route capacity to trajectory-based aircraft when the available airspace is restricted. Real-time information on corridor location, and logistics and procedures for dynamically relocating a corridor while it is in effect must be developed. If corridor use is to be widespread, techniques for merging, diverging, and crossing corridors may also be required. Implementation decision required to determine if this is feasible and cost effective.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-0370

OI Group: Capacity Management Operational Improvements



Operational Improvement Listing

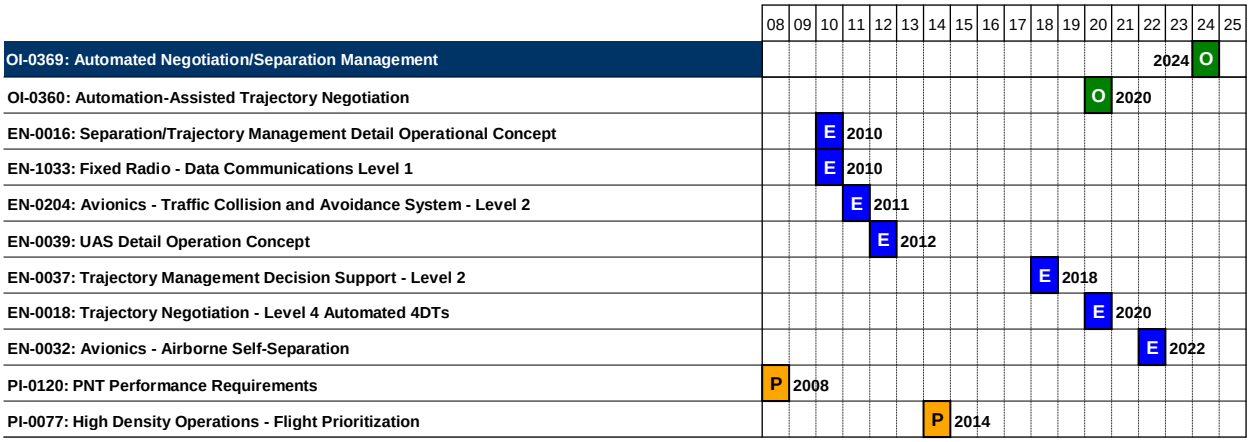
OI-0369 Automated Negotiation/Separation Management

Description: Trajectory management is enhanced by automated negotiation of Four-Dimensional Trajectories (4DTs) between properly equipped aircraft and ground automation for separation management. All aircraft in Trajectory-Based Operations (TBO) airspace must be equipped for this function. The ANSP Separation Management function is fully automated, and separation responsibility is delegated to automation. For specified operations, tasks are delegated to the flight crew to take advantage of aircraft capabilities. To manage separation, Air Navigation Service Provider (ANSP) automation negotiates short-term, conflict-driven updates to the 4DT agreements with the aircraft. This will enable higher density of operations thus higher capacity as well as a decrease in human errors in trajectory negotiation and entry. This Operational Improvement requires a Policy/Implementation Decision to determine appropriate roles/responsibilities allocated between humans/automation and air/ground.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-0370

OI Group: Trajectory Management - En Route/Multi-Domain Operational Improvements



OI-0370 Trajectory-Based Management - Full Gate-To-Gate

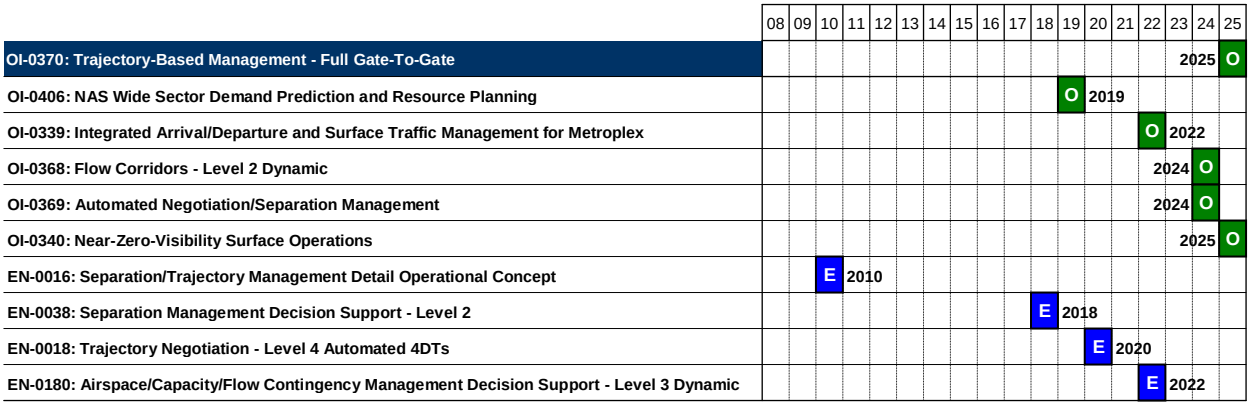
Description: All aircraft operating in high density airspace are managed by Four Dimensional Trajectory (4DT) in En Route climb, cruise, descent, and airport surface phases of the flight. This is the end state 4DT-based capability. This would require the ability to calculate, negotiate, and perform conformance monitoring by Air Navigation Service Providers (ANSPs) including the integration of separation assurance and traffic management time constraints (e.g., runway times of arrival, gate times of arrival). This will be enabled by the trajectory exchange through electronic data communications, as well as many new surface automation and 3D (x, y, and time) trajectory operations. In high-density or high-complexity airspace, precise 4DTs will be used, dramatically reducing the uncertainty of an aircraft's future flight path, in terms of predicted spatial position (latitude, longitude, and altitude) and times along points in its path. This enhances the capacity and throughput of the airspace to accommodate high levels of demand. In trajectory-based airspace, differing types of operations are conducted with performance-based services applied based on the anticipated traffic characteristics. User preferences are accommodated to the greatest extent possible, and trajectories are constrained only to the extent required to accommodate demand or other national concerns, such as security or safety.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Trajectory Management - En Route/Multi-Domain Operational Improvements

Operational Improvement Listing



OI-0381 GBAS Precision Approaches

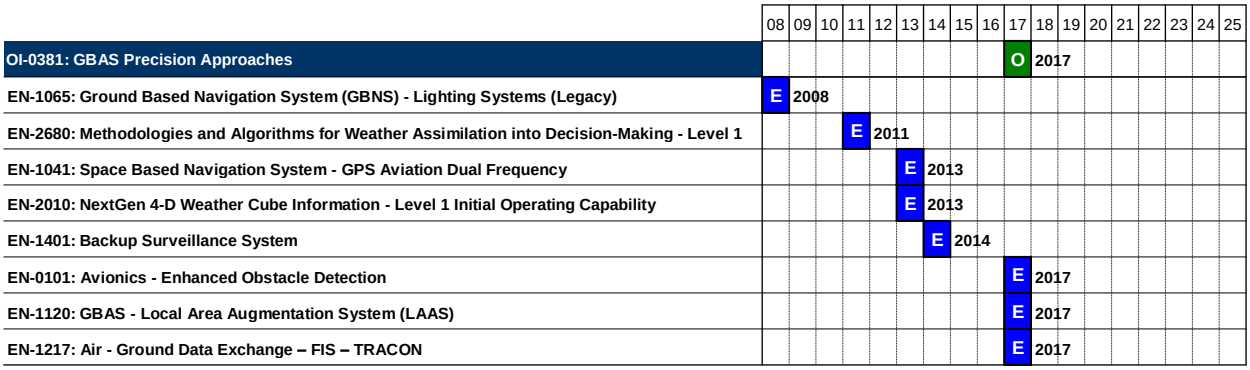
Description: Ground Based Augmentation System (GBAS) would provide Category I and Category II/III precision approach and landing services and position information for surface operations. GBAS Category I systems may be installed at airports requiring a stand-alone augmented GPS navigation and landing capability, or at airports where Satellite-Based Augmentation System (SBAS) coverage is unable to meet existing navigation and landing requirements due to insufficient satellite coverage or availability (e.g., some locations in Alaska). GBAS Category II/III systems may be installed at higher usage airports that require more capable navigation and landing services. A single GBAS system provides precision-approach capabilities to multiple runways or landing areas. GBAS provides precision-approach service that is robust to atmospheric phenomena that might cause loss of SBAS vertical guidance.

Functional Drivers: This OI provides affordable low ceiling/visibility airport access to currently under-utilized regional, smaller commercial, and general aviation airports to support expanded commercial air service and viable air taxi service. Low ceiling/visibility airport access is provided through a combination of GBAS and other technologies such as enhanced lighting systems as to aid the pilot in approach guidance and acquisition of the runway environment for safe operations.

SOPR: FAA ***SOPR Unique Reference:*** 107107

SOCR: ***Primary Supported OIs:*** OI-0317

OI Group: Trajectory Management - Arrival/Departure Operational Improvements



Operational Improvement Listing

OI-0400 Wake Turbulence Mitigation: Departures - Wind-Based Wake Procedures

Description: Changes to wake rules are implemented based on wind measurements. Procedures allow more closely spaced departure operations to maintain airport/runway capacity. Procedures are developed at applicable locations based on the results of analysis of wake measurements and safety analysis using wake modeling and visualization. During peak demand periods, these procedures allow airports to maintain airport departure throughput during favorable wind conditions. A staged implementation of changes in procedures and standards, as well as the implementation of new technology will safely reduce the impact of wake vortices on operations. This reduction applies to specific types of aircraft and is based on wind blowing an aircraft's wake away from the parallel runway's operating area.

Functional Drivers: The new rules will set wake-based departure procedures at specific airports for specific periods of time. This operating period will have static procedures based on the prevailing wind conditions. As wind conditions change, alternate procedures will be deployed with corresponding operating periods. As technology matures and further study provides more detail and accuracy of Wake Vortices, implementation will be in phases to aid in separation criteria on closely spaced parallel runways for departures.

SOPR: FAA ***SOPR Unique Reference:*** 102140

SOCR: ***Primary Supported OIs:*** OI-0402

OI Group: Trajectory Management - Arrival/Departure Operational Improvements

	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
OI-0400: Wake Turbulence Mitigation: Departures - Wind-Based Wake Procedures						O 2013												
EN-0023: Surface Movement - Detail Operational Concept				E 2011														
EN-0150: Wake Vortex Configuration Advisory Decision Support - Level 1 Static Drift Only					E 2012													
EN-1007: Avionics - Trajectory Management - Advanced Surface Operations					E 2012													
EN-2470: Weather Information - Wake Vortex - Level 1					E 2012													

OI-0401 Wake Turbulence Mitigation: Arrivals - Wind-Based Wake Procedures

Description: Changes to wake rules are implemented based on wind measurements. Procedures allow more closely spaced arrival operations to maintain airport/runway capacity. Procedures are developed at applicable locations based on the results of analysis of wake measurements and safety analysis using wake modeling and visualization. During peak demand periods, these procedures allow airports to maintain airport arrival throughput during favorable wind conditions. A staged implementation of changes in procedures and standards, as well as the implementation of new technology will safely reduce the impact of wake vortices on operations. This reduction applies to specific types of aircraft and is based on wind blowing an aircraft's wake away from the parallel runway's operating area.

Functional Drivers: The new rules will set wake-based arrival procedures at specific airports for specific periods of time. This operating period will have static procedures based on the prevailing wind conditions. As wind conditions change, alternate procedures will be deployed with corresponding operating periods. As technology matures and further study provides more detail and accuracy of Wake Vortices, implementation will be in phases to aid in separation criteria on closely spaced parallel runways for departures. Then, they will expand to closely spaced parallel runways for arrivals.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-0403

OI Group: Trajectory Management - Arrival/Departure Operational Improvements

	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
OI-0401: Wake Turbulence Mitigation: Arrivals - Wind-Based Wake Procedures								O 2015										
EN-0023: Surface Movement - Detail Operational Concept				E 2011														
EN-0150: Wake Vortex Configuration Advisory Decision Support - Level 1 Static Drift Only					E 2012													
EN-1007: Avionics - Trajectory Management - Advanced Surface Operations					E 2012													
EN-2470: Weather Information - Wake Vortex - Level 1					E 2012													

Operational Improvement Listing

OI-0402 Wake Turbulence Mitigation: Departures - Dynamic Wind Procedures

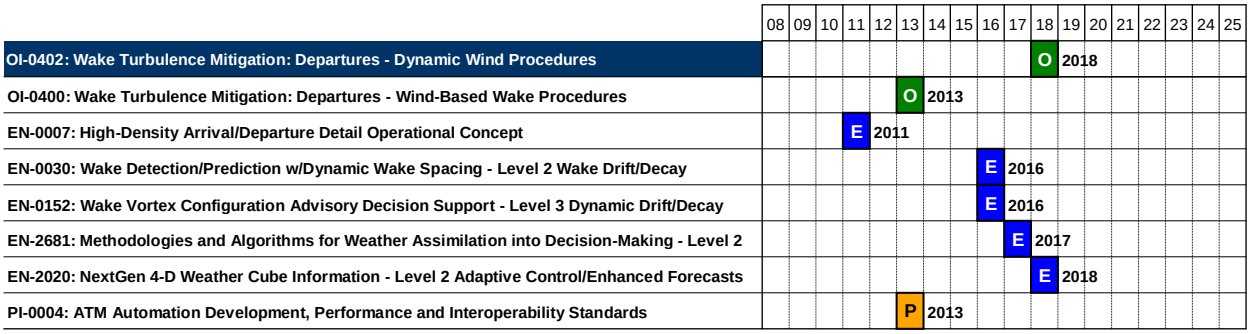
Description: Departure spacing and separation rules are dynamically adjusted to accommodate wake drift and decay. Longitudinal departure spacing is dynamically adjusted based on ground-based wind measurements, aircraft type and algorithms to predict wake drift and decay. Dynamic adjustments are made when favorable wind conditions are forecast to persist for perhaps a half hour or more. Controller automation is enhanced to provide controllers with dynamic spacing and separation information that may include a larger matrix of separation standards than the current 4x4 matrix, with more specific pair-wise spacing requirements within and between aircraft types.

Functional Drivers: The new rules will build on earlier static wake-based procedures for lateral departure spacing on closely spaced parallel runways and will add dynamically adjusted wake-based procedures for lateral and longitudinal departure spacing for closely spaced parallel runways and longitudinal departure spacing for single runways.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Trajectory Management - Arrival/Departure Operational Improvements



OI-0403 Wake Turbulence Mitigation: Arrivals - Dynamic Wind Procedures

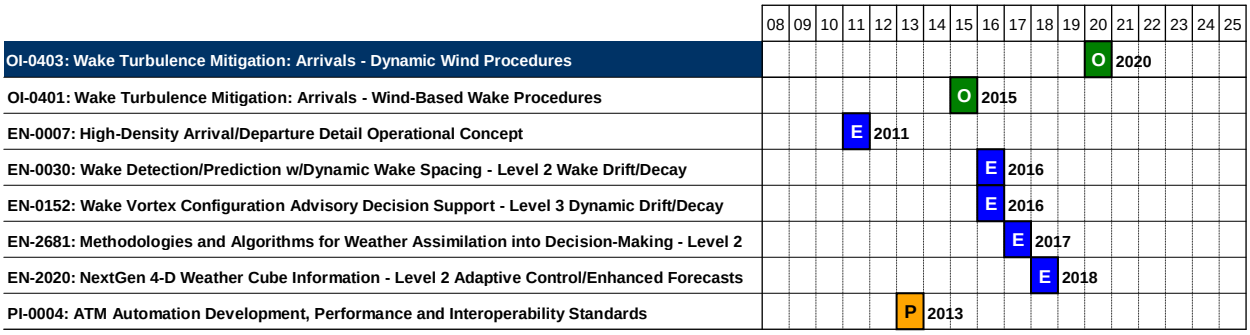
Description: Arrival spacing and separation rules are dynamically adjusted to accommodate wake drift and decay. Longitudinal departure spacing is dynamically adjusted based on ground-based wind measurements, aircraft type and algorithms to predict wake drift and decay. Dynamic adjustments are made when favorable wind conditions are forecast to persist for perhaps a half hour or more. Controller automation is enhanced to provide controllers with dynamic spacing and separation information that may include a larger matrix of separation standards than the current 4x4 matrix, with more specific pair-wise spacing requirements within and between aircraft types.

Functional Drivers: The new rules will build on earlier static wake-based procedures for lateral arrival spacing on closely spaced parallel runways and will add dynamically adjusted wake-based procedures for lateral and longitudinal arrival spacing for closely spaced parallel runways and longitudinal arrival spacing for single runways.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Trajectory Management - Arrival/Departure Operational Improvements



Operational Improvement Listing

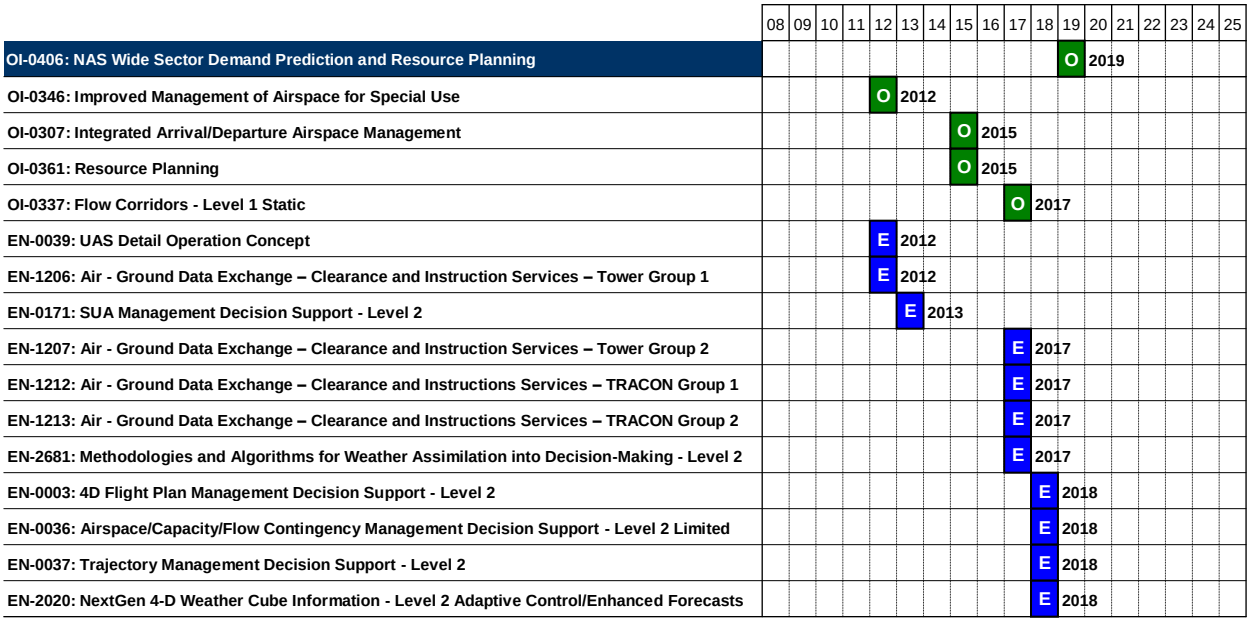
OI-0406 NAS Wide Sector Demand Prediction and Resource Planning

Description: National Airspace System (NAS) resource and Collaborative Decision Making (CDM) data are combined in one integrated decision support tool. Strategic management of resources (e.g., airspace, sectors, personnel, facilities, NAS systems) meet changes in systemic demand due to increases in air traffic, seasonality, or city pair business case decisions. Resources are proactively adjusted and assigned based on projections of shifting demand. The Air Navigation Service Provider (ANSP) and stakeholders use decision management systems to achieve consensus once NAS-wide modeling efforts are accomplished and analyzed. Strategic long-term planning with dynamic and flexible airspace and airports minimizes adverse impacts to users. Changes are modeled against various solutions to mitigate adverse impacts. Traffic management strategic change decision support tools model and analyze the effect of a change and develop trend analysis for validation of the planning process. Some of these tools are automated system-to-system while others require the human-centric collaborative decision process. ANSP is responsible for managing the NAS; the CDM process results in consensus among the stakeholders about proposed resolutions.

SOPR: FAA ***SOPR Unique Reference:*** 105104

SOCR: ***Primary Supported OIs:*** OI-0370

OI Group: Capacity Management Operational Improvements



Operational Improvement Listing

OI-0408 Provide Full Flight Plan Constraint Evaluation with Feedback

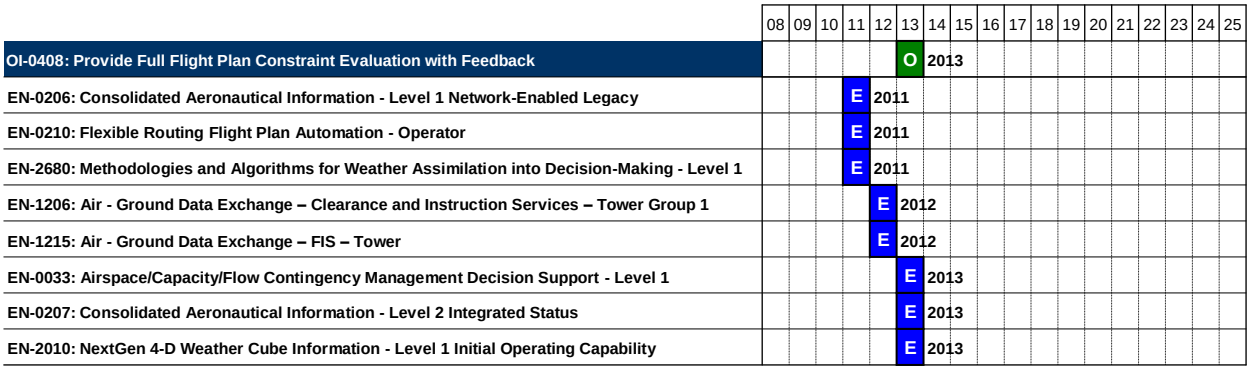
Description: Timely and accurate National Airspace System (NAS) information allows users to plan and fly routings that meet their objectives. Constraint information that impacts proposed flight routes is incorporated into Air Navigation Service Provider (ANSP) automation, and is available to users for their pre-departure flight planning. Constraint information is both temporal and volumetric. Constraint volumes can be "hard constraints" (no access to this volume for this time period), "conditional constraints" (flights are subject to access control), and "advisory constraints" (service reduction or significant weather). Flight trajectories are built from the filed flight plan and the trajectory is evaluated against the constraint volumes. Feedback is provided to the filer (not the flight deck) on the computed trajectory with a listing of constraints, the time period for the constraints, and the nature of access. A user can adjust the flight plan based on available information, and refile as additional information is received, or can wait for a later time to make adjustments. Up to NAS departure time, as constraints change, expire, or are newly initiated, currently filed flight plans are retested. Update notifications are provided to filers if conditions along the trajectory change. In addition, the user can submit alternative flight plans.

Functional Drivers: The ANSP will evaluate the alternate plans and provide feedback on each one, highlighting the one that most efficiently meets flow management and flight operator goals. Users can refile pre-flight using the selected preferred plan. Users can interact with the ANSP through their Flight Operations Centers (FOCs) or through alternate means such as a private service. Alternate flight plans may be selected during flight as unexpected delays occur. User will be provided constraint information such as re-routes, departure or en-route delays on a continuous basis. Users will have the capability to receive and process real-time constraint information independent of the flight planning process allowing users to optimize their business objectives.

SOPR: FAA ***SOPR Unique Reference:*** 101102

SOCR: ***Primary Supported OIs:*** OI-0303, OI-4500, OI-0306

OI Group: Flow Contingency Management Operational Improvements



Operational Improvement Listing

OI-0409 Net-Centric Virtual Facility

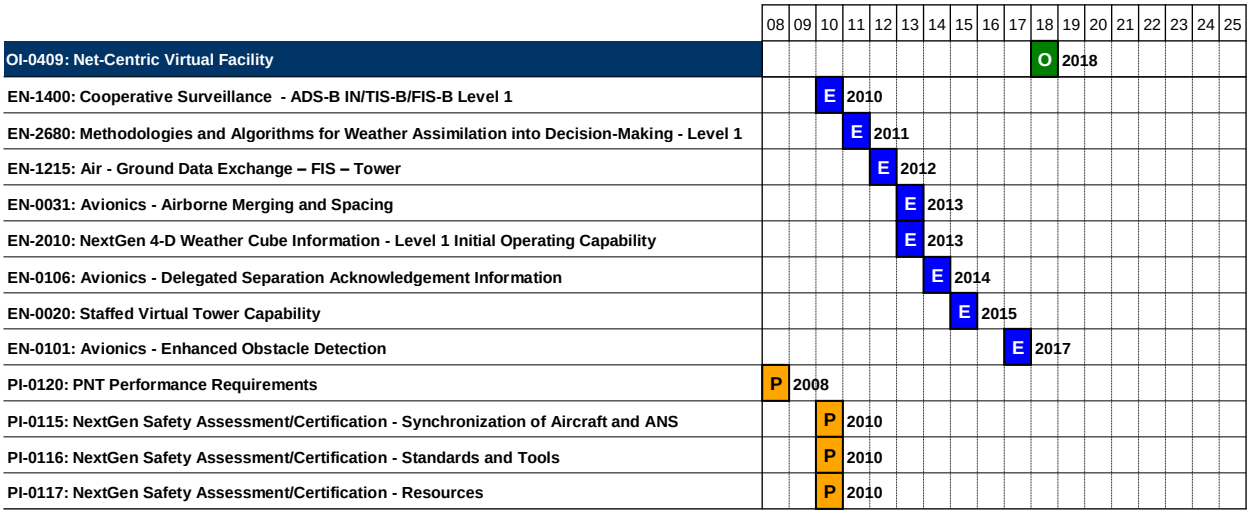
Description: Next Generation Towers provide Air Traffic Management (ATM) services for operations into and out of designated airports without physically constructing, equipping, and/or sustaining tower facilities at these airports. Emerging technology replaces "out the window" visual observations from conventional tower cabs by acquiring, processing, communicating, and displaying equivalent information used by Air Navigation Service Providers (ANSPs) at remote locations aided with decision support tools. Deployment of Next Generation Towers allows a reduction in the total number of service delivery points. Eventually NextGen capabilities are integrated into new general service delivery point facilities. Remote NextGen tower capabilities provide ATM services for operations into and out of airports without a physical ATM presence. This accommodates managing increases in life cycle costs to sustain, expand, and improve services in response to steadily increasing demand. Instead of "out the window" visual surveillance, controllers obtain situational awareness aided by surface surveillance displayed on a tower information display system and a suite of decision support tools using ground system and aircraft-derived data. Weather, traffic and other relevant information are displayed on a traffic information display system to avoid discontinuities associated with the mix of heads up versus heads down operations. Weather is distributed to and from aircraft using data communications. Weather data are available to aircraft and other users via a net centric information system. Clearance delivery and pushback into movement or non movement areas is accomplished by voice and/or data communications to the aircraft, aided by situational awareness derived from surveillance sensors and conformance monitoring tools presented directly on the ANSP display. Special airport sensors detect runway obstructions at the airport and automatically alert controllers and pilots of the obstruction via voice and/or Data Comm. Separation assurance is accomplished with the aid of ground and terminal surveillance data from sensors located at the airport. ANSPs have improved conflict alert aids available for use. Some separation responsibility is delegated to aircraft equipped with "sense and avoid" or synthetic aperture type capability. Traffic management initiatives and flight plan data are available to flight operators and ANSPs via net-centric information capabilities to improve common situational awareness. Decision support tools assist ANSPs with planning taxi routes, and arrival and departure sequencing. Some traffic synchronization responsibility is delegated to aircraft equipped to perform these operations.

Functional Drivers: At non-towered, single-runway airports and possibly very low density multiple runway airports Net-Centric Virtual Facilities increase Instrument Meteorological Conditions (IMC) throughput with remote personnel providing needed services similar to those provided by current ATC towers, but with enhanced capabilities in severe weather and low visibility conditions. Expected use is with separation functions (terrain, obstructions, aircraft, wake turbulence, etc.) provided either by ground automation or through aircraft-based conflict detection/resolution algorithms. Benefits can be realized not only in the areas of capacity and ANSP productivity but also cost avoidance for not building towers. Once Net-Centric Virtual Facilities are developed for IMC operations, they can also provide basic Visual Meteorological Conditions (VMC) safety benefits for traffic operating at non-towered airports.

SOPR: FAA ***SOPR Unique Reference:*** 109402

SOCR: ***Primary Supported OIs:***

OI Group: Trajectory Management - Arrival/Departure Operational Improvements



Operational Improvement Listing

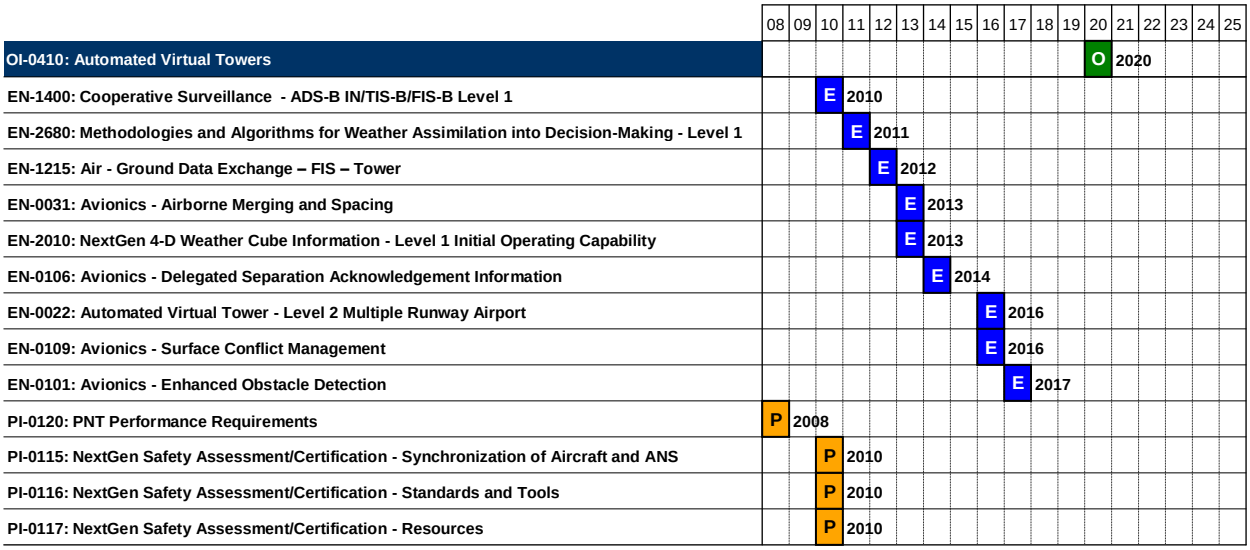
OI-0410 Automated Virtual Towers

Description: At non-towered, multiple-runway airports and small airports in metroplex environments, Automated Virtual Towers (AVTs) increase Instrument Meteorological Conditions (IMC) throughput and provide basic Visual Flight Rule (VFR) services. AVTs operate autonomously, with separation functions (terrain, obstructions, aircraft, wake turbulence, etc.) provided either by ground automation or through aircraft-based conflict detection/resolution algorithms. Benefits can be realized not only in the areas of capacity and Air Navigation Service Provider (ANSP) productivity, but also cost avoidance for not building towers. Once AVTs are developed for IMC operations, they can also provide basic Visual Meteorological Conditions (VMC) safety benefits for traffic operating at non-towered airports.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Trajectory Management - Arrival/Departure Operational Improvements



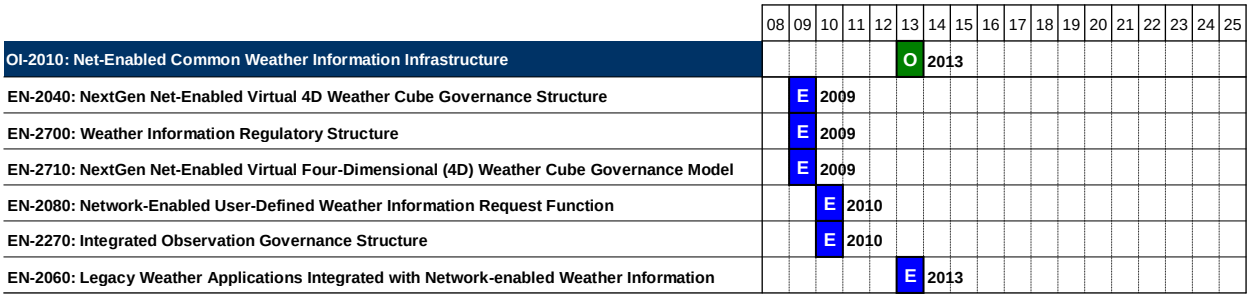
OI-2010 Net-Enabled Common Weather Information Infrastructure

Description: This improvement provides the foundational infrastructure and organizational elements needed to support a single, authoritative, network-enabled common source of weather information. The infrastructure and organizational elements includes governance models and structures, data standards, and initial information systems necessary to support a comprehensive development and integration program. The integration of weather sources and the development of a common source of weather information is achieved via OI-2020, OI-2021, and OI-2022. Working together, these improvements address these problems, while also reducing weather information system operational and maintenance costs through the use of net-centric architecture.

SOPR: DOC ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-2020

OI Group: Weather Information Services Operational Improvements



Operational Improvement Listing

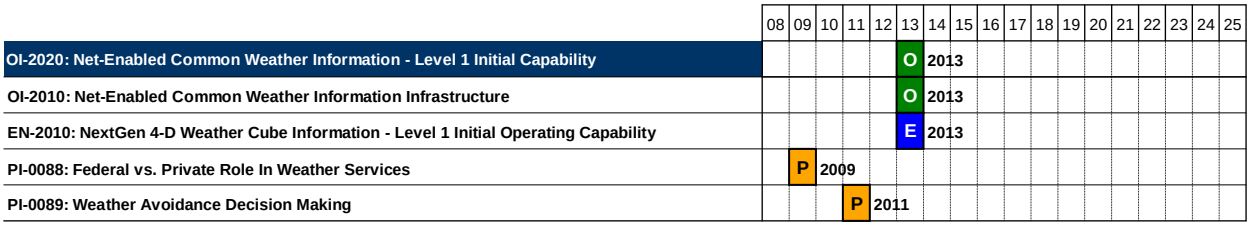
OI-2020 Net-Enabled Common Weather Information - Level 1 Initial Capability

Description: This improvement, when paired with the net-enabled common weather information infrastructure in OI-2010, provides the first level capability that supports the NextGen concept of operations to assimilate weather information into decision-making for flight, safety, security, environmental, and airport operations. This capability begins to replace today's patchwork of conflicting sources of weather observations and forecasts. This requires that the network of weather observations and the set of forecasting capabilities be targeted to meet NextGen's spiral development decision-making needs in an efficient and cost effective manner. The information will be provided at the correct accuracy, resolution, update frequency, geographic scale, etc. required to commence the transition to the NextGen concept of operation. Data contents include state variables such as temperature, dew point, surface winds, etc. It also has enhanced forecasting capabilities for winter weather, icing, turbulence, convection, ceiling and visibility, and winds aloft. Finally, this operational improvement sets in motion the extension of the traditional set of users of weather information to include automated decision support systems; the information must be usable by such systems directly and without human intervention. The first level includes the initial use of a limited single authoritative source of weather information for a prioritized subset of weather types that impact flight operations.

SOPR: DOC ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-2021

OI Group: Weather Information Services Operational Improvements



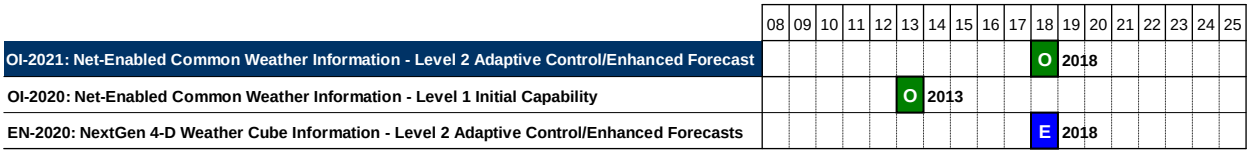
OI-2021 Net-Enabled Common Weather Information - Level 2 Adaptive Control/Enhanced Forecast

Description: This improvement provides the second level capability that supports the NextGen concept of operations to assimilate weather in decision-making. This continues the networking of weather observations and improves the set of forecast capabilities targeted to meet NextGen's spiral development decision-making needs in an efficient and cost effective manner. This will include the first robust 4D Weather Data Cube/Single Authoritative Source and will have additional information added beyond OI-2020. This operational improvement continues the extension of using digital weather information to include automated decision support systems for flight planning, conflict resolution, ground operations, and other areas of operation; the information must be usable by such systems directly and without human intervention. The information will be provided at the correct accuracy, resolution, update frequency, geographic scale, etc. required to enact the intermediate NextGen concept of operation.

SOPR: DOC ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-2022

OI Group: Weather Information Services Operational Improvements



OI-2022 Net-Enabled Common Weather Information - Level 3 Full NextGen

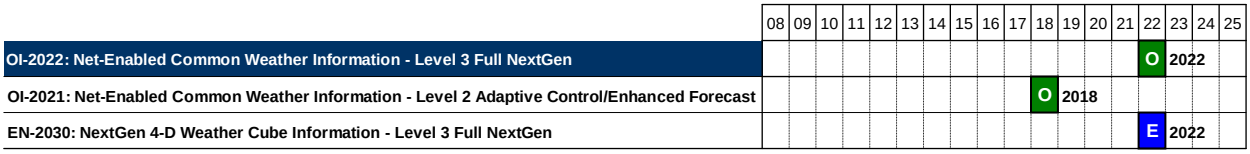
Description: This improvement provides the full capability that supports the NextGen concept of operations to assimilate weather in decision-making for all area of operations and completes the replacement of today's patchwork of conflicting sources of weather observations and forecasts. The information will be provided at the correct accuracy, resolution, update frequency, geographic scale, etc. required to enact the end-state NextGen concept of operation. This final level includes the use of unmanned aerial vehicles used as observation platforms and more advanced predictive model improvements.

SOPR: DOC ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Weather Information Services Operational Improvements

Operational Improvement Listing



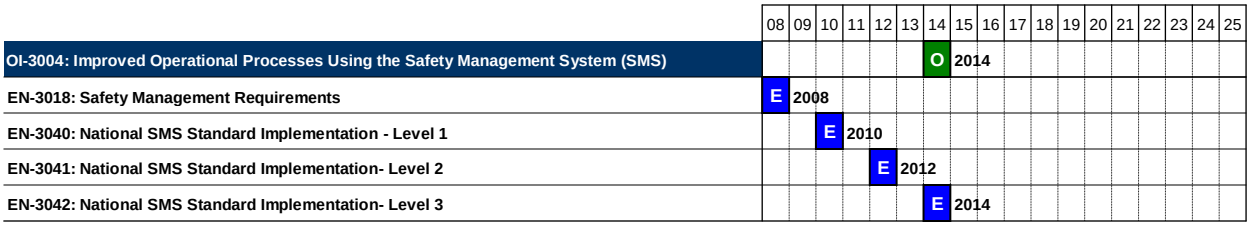
OI-3004 Improved Operational Processes Using the Safety Management System (SMS)

Description: The risk of incidents and accidents is reduced by the systematic application of standardized safety management processes throughout government and industry. This provides a consistent approach to achieve an acceptable level of safety risk in the operation of aircraft, certification of procedures and equipment, the conduct of maintenance, etc., and establishes the mechanisms necessary to deliver and monitor safety performance. Organizations will speak the same language regarding safety; safety management processes, tools, and information will be aligned within and among all aviation participants.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Safer Practices Operational Improvements



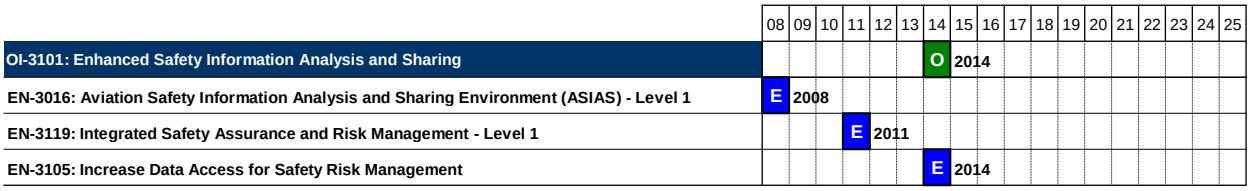
OI-3101 Enhanced Safety Information Analysis and Sharing

Description: The risk of incidents and accidents is reduced through enhanced analysis and sharing of safety information throughout the Air Transportation System (ATS). Safety analysis is enhanced through the collection and communication of safety data across the ATS, and the consistent application of safety management methods to identify and assess risk. This supports organizational Safety Management System (SMS) Safety Risk Management (SRM), safety assurance, and interoperability requirements, and helps transform the system safety management approach from isolated and reactive, to integrated and proactive. It requires advancing the methods used to identify and mitigate latent and emerging safety risk in the ATS. Vulnerabilities, hazards, threats, etc., are sought, identified, and managed before they result in an incident or accident. This is dependent on voluntary participation and a protected information sharing environment.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Safer Practices Operational Improvements



Operational Improvement Listing

OI-3102 Improved Safety for NextGen Evolution

Description: Enhanced methods are provided that support making changes to the air transportation system, including: advanced capabilities for integrated, predictive safety assessment; improved validation and verification processes supporting certification; an enhanced focus on safe operational procedures; and enhanced training concepts for safe system operation. NextGen development must follow a safety order of precedence that begins with designing for minimum risk. If risks cannot be eliminated through changes to the system, the next step is to mitigate the risk to an acceptable level. If it is not possible to eliminate or mitigate the risk adequately, the third step provides operators with adequate warnings to avert the hazard effects. When these steps are not possible or reasonable, and as a final option, procedures and training should be enhanced to achieve an acceptable level of safety. Also in accordance with an effective Safety Management System (SMS), when feedback identifies a potential design flaw or unintended consequence, this information will be used to improve the design, warning, or procedures.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Safer Practices Operational Improvements

	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
OI-3102: Improved Safety for NextGen Evolution									O	2016								
EN-3050: Advanced Complex System Validation and Verification Methods					E	2012												
EN-3107: Advanced Capabilities for Integrated, Predictive Safety Assessment							E	2014										
EN-3108: Enhanced Focus on Safe Operational Procedures							E	2014										
EN-3109: Advanced Training Concepts for Safe System Operation							E	2014										

OI-3103 Improved Safety of Operational Decision Making

Description: Systems interfaces that reduce the risk of error in operational decision making are essential to maintaining and improving aviation safety. Systems interfaces are improved to provide better situation awareness. System designs are improved to maintain appropriate human engagement, and improved operational decision aids are implemented to support task completion in nominal and off-nominal system states.

SOPR: Industry ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Safer Systems Operational Improvements

	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
OI-3103: Improved Safety of Operational Decision Making																2025		O
EN-3060: Improved Operational Decision Aids - Airborne Level 1								E	2015									
EN-3068: Improve Operational Decision Aids - Ground Level 1								E	2015									
EN-3110: Ensure the Availability and Accessibility of Required Information								E	2015									
EN-3111: Increase the Usefulness and Understandability of Information								E	2015									
EN-3112: Maintain Appropriate Human Engagement								E	2015									
EN-3122: Reduced Controlled Flight into Terrain - Level 1								E	2015									
EN-3061: Improved Operational Decision Aids - Airborne Level 2																2025		E
EN-3069: Improve Operational Decision Aids - Ground Level 2																2025		E
EN-3123: Airborne Weather Information Technologies- Level 1																2025		E
EN-3124: Reduced Controlled Flight into Terrain - Level 2																2025		E
EN-3125: Airborne Weather Information Technologies- Level 2																2025		E

Operational Improvement Listing

OI-3104 Enhanced Safety of Airborne Systems

Description: Safety requirements are integrated into the development and implementation of NextGen advancements for aircraft, to maintain or improve safety as changes are introduced. The reliability and airworthiness of aircraft is improved at the sub-system level; vehicle systems health management is improved at the sub-system and system level. The reliability and accuracy of operational information sourced from vehicle systems is improved. Aircraft conformance to more stringent operational requirements is improved, and aircraft system contributions to crash survivability are enhanced.

SOPR: Industry ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Safer Systems Operational Improvements

	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
OI-3104: Enhanced Safety of Airborne Systems																2025		O
EN-3056: Improved Vehicle Systems Health Management - Level 1								E	2015									
EN-3058: Increased Reliability and Accuracy of Data and Information - Level 1								E	2015									
EN-3062: Ensure Aircraft Conformance to More Stringent Operations Requirements - Level 1								E	2015									
EN-3064: Increase Aircraft System Contributions to Survival in Crash Scenarios - Level 1								E	2015									
EN-3127: Reduce Airborne Icing-Related Incidents - Level 1								E	2015									
EN-3130: Increased Crash Survivability - Aircraft Structures & Components								E	2015									
EN-3131: Increased Crash Survivability- Aircraft Fire Prevention & Suppression								E	2015									
EN-2810: Aircraft Systems - Turbulence Mitigation											E	2018						
EN-2820: Aircraft Systems - Icing Alleviation											E	2018						
EN-2830: Aircraft Systems - Low Visibility Alleviation											E	2018						
EN-2840: Aircraft Systems - Vortex Avoidance Alleviation											E	2018						
EN-2850: Aircraft Systems - Radiation Alleviation											E	2018						
EN-2860: Aircraft Systems - Volcanic Ash Alleviation											E	2018						
EN-2870: Aircraft Systems - Weather Mitigation Requirements											E	2018						
EN-3057: Improved Vehicle Systems Health Management - Level 2																2025		E
EN-3059: Increased Reliability and Accuracy of Data and Information - Level 2																2025		E
EN-3063: Ensure Aircraft Conformance to More Stringent Operations Requirements - Level 2																2025		E
EN-3065: Increase Aircraft System Contributions to Survival in Crash Scenarios- Level 2																2025		E
EN-3113: Improve Reliability and Airworthiness of Aircraft																2025		E
EN-3126: Improved Aircraft Upset Prevention and Recovery																2025		E
EN-3128: Reduce Airborne Icing-Related Incidents - Level 2																2025		E

Operational Improvement Listing

OI-3105 Enhanced Safety of Ground-based Systems

Description: Safety requirements are integrated into the development and implementation of NextGen advancements for ground-based systems, to maintain or improve safety as changes are introduced. Ground-based systems health management is improved at the sub-system and system level. Ground-based systems support more stringent operational requirements, and contribute to enhanced crash survivability.

SOPR: Industry ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Safer Systems Operational Improvements

	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
OI-3105: Enhanced Safety of Ground-based Systems																2025		O
EN-3066: Improved Ground-Based Systems Health Management - Level 1								E	2015									
EN-3070: Ensure Ground-based System Conformance to Operations Requirements - Level 1								E	2015									
EN-3072: Increase Ground-based System Contribution to Survival in Crash Scenarios - Level 1								E	2015									
EN-3132: Reduce Ground Icing-Related Incidents - Level 1								E	2015									
EN-3067: Improved Ground-Based Systems Health Management - Level 2																2025		E
EN-3071: Ensure Ground-based System Conformance to Operations Requirements - Level 2																2025		E
EN-3073: Increase Ground-based System Contribution to Survival in Crash Scenarios - Level 2																2025		E
EN-3133: Reduce Ground Icing-Related Incidents - Level 2																2025		E

OI-3106 Increased International Cooperation for Aviation Safety

Description: The development and implementation of safer practices and safer systems is encouraged worldwide through international participation. Specifically, increased participation in international aviation is encouraged, as is the development of international aviation development partnerships. Provide support for the execution of the International Civil Aviation Organization (ICAO) Global Aviation Safety Roadmap and the associated implementation plan.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Safer Worldwide Operational Improvements

	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
OI-3106: Increased International Cooperation for Aviation Safety													O	2020				
EN-3114: Participate Internationally in Aviation Forums									E	2016								
EN-3115: Establish International Aviation Development Partnerships									E	2016								
EN-3116: Support Execution of ICAO Global Aviation Safety Roadmap and Implementation Plan									E	2016								

OI-3107 Improved Safety Across Air Transportation System Boundaries

Description: The safety of intermodal and international operations is improved by harmonization of standards, regulations and procedures, and improvements in their implementation. The safety of dangerous goods handling for air transportation is improved through intermodal and international harmonization of standards.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Safer Worldwide Operational Improvements

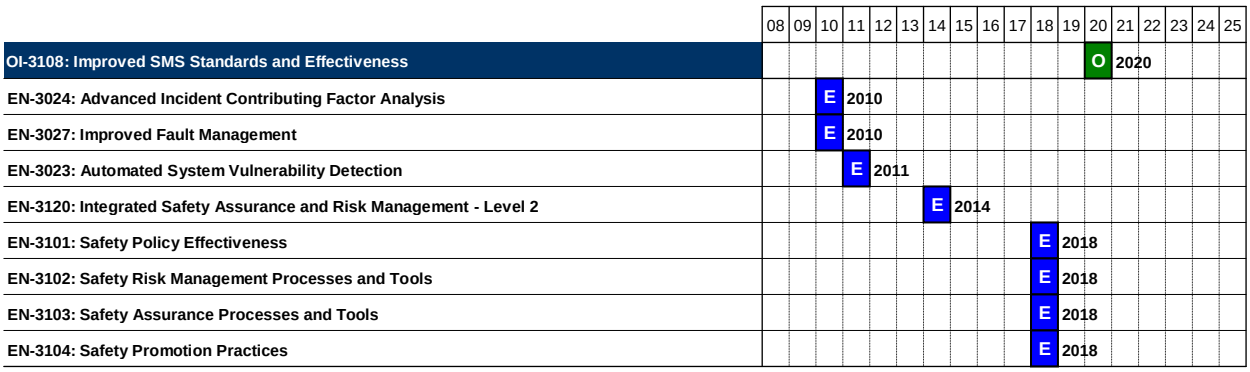
	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
OI-3107: Improved Safety Across Air Transportation System Boundaries													O	2020				
EN-3030: Standards Harmonization for Multi-mode Transport of Dangerous Goods					E	2012												
EN-3118: Improve the Implementation of Harmonized Standards, Regulations, and Procedures									E	2016								
EN-3129: Harmonize Standards, Regulations and Procedures									E	2016								

Operational Improvement Listing

OI-3108 Improved SMS Standards and Effectiveness

Description: Following implementation of the National Safety Management System (SMS) Standard by the Joint Planning and Development Office (JPDO) members and the organizations they oversee, continuous improvement of the processes, tools, and procedures associated with safety management is undertaken to ensure that safety is also continuously improved.

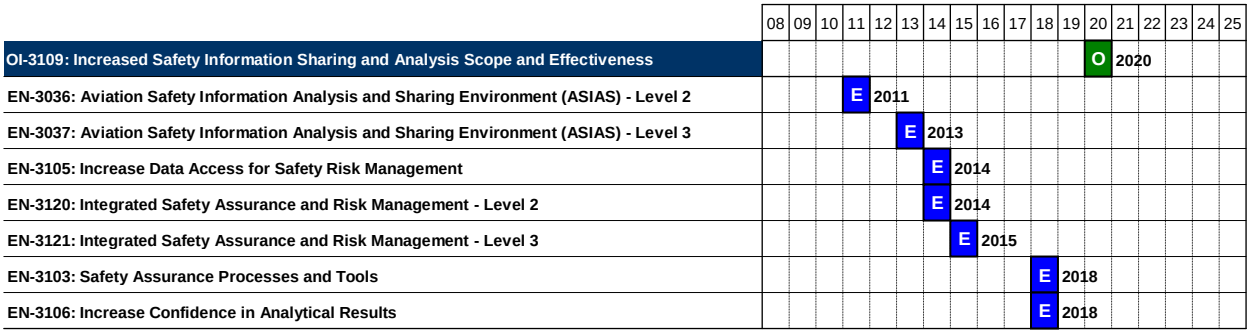
SOPR: FAA
SOPR Unique Reference:
SOCR:
Primary Supported OIs:
OI Group: Safer Practices Operational Improvements



OI-3109 Increased Safety Information Sharing and Analysis Scope and Effectiveness

Description: Following the creation of the Aviation Safety Information Analysis and Sharing (ASIAS) environment and the integration of existing analytical tools within it, improvements will be made to the environment and the analytical capabilities. Expansion of the ASIAS environment to include additional data sources, combined with action that improve data security, quality, and scope will provide continuous improvement of the ASIAS environment. Improvements in the analytical techniques and tools used to extract information from the various data sources will continuously improve the understanding of the data and its implications.

SOPR: FAA
SOPR Unique Reference:
SOCR:
Primary Supported OIs:
OI Group: Safer Practices Operational Improvements

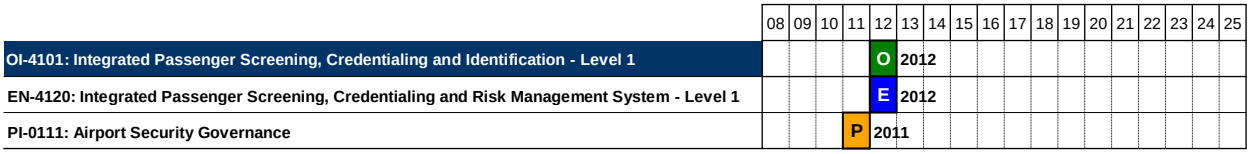


OI-4101 Integrated Passenger Screening, Credentialing and Identification - Level 1

Description: All passengers on commercial flights are prescreened and high risk passengers are identified through a background checking and/or biometric identification capability that utilizes a set of consolidated watch lists. At high enplanement airports, registered travelers have credentials that can be identified and verified through biometrics. Consideration should be given to the privacy issues associated with background checks on passengers.

SOPR: DHS
SOPR Unique Reference:
SOCR:
Primary Supported OIs: OI-4106
OI Group: Secure People Operational Improvements

Operational Improvement Listing



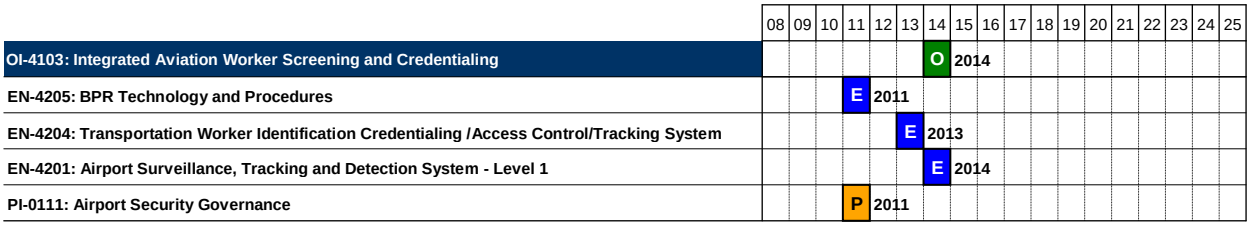
OI-4103 Integrated Aviation Worker Screening and Credentialing

Description: Aviation workers are regularly screened and credentialed from initial employment to termination using a comprehensive, integrated, national, common vetting and credentialing capability that utilizes validated and continuously updated watch lists and established biometrics and credential standards.

SOPR: DHS ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Secure People Operational Improvements



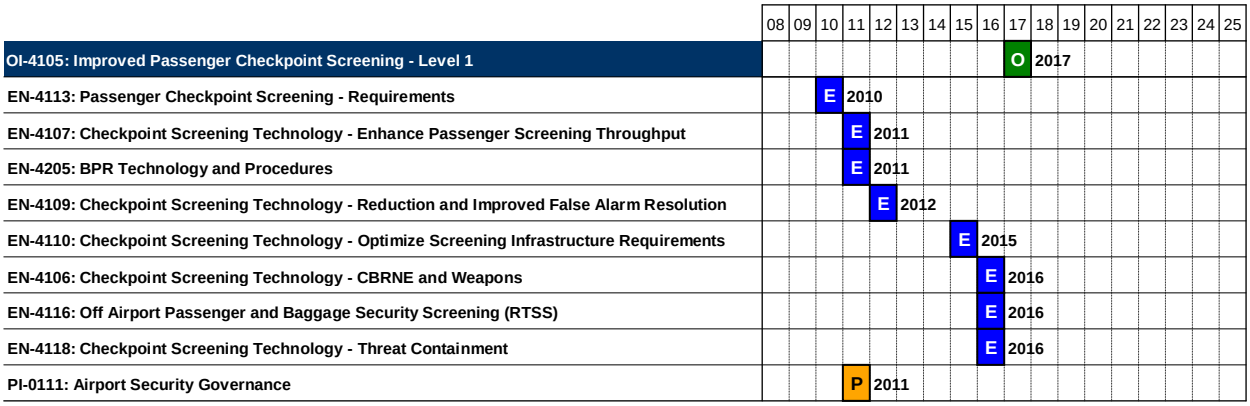
OI-4105 Improved Passenger Checkpoint Screening - Level 1

Description: Security is enhanced by improved passenger screening for explosives, chemicals, biological agents, nuclear devices, radiological material and weapons that might be introduced into the passenger compartments of civil aviation and used to destroy, disable, and hijack the airplane. Screening methods will be improved to enable processing the projected increasing passenger volumes. The checkpoint is digitally linked to the airport security command center through imbedded sensors located throughout the terminal building, departures curb, approach roadway and passenger check-in process, no longer simply concentrated at the security checkpoint. These sensors will be interconnected to provide for instantaneous alert and recognition of any threat making its way to the checkpoint/gate. This improvement would provide for improved levels of threat detection, lower rate of false alarms, increased throughput and improved alarm resolution of passengers. The expected 250% increase in passenger volume through the check-point in the future will place continuing demands on the amount of physical space needed for the check-point. The NextGen check-point would balance the efficacy of the technologies deployed with check-point physical space demands.

SOPR: DHS ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-5015, OI-5014

OI Group: Secure People Operational Improvements



Operational Improvement Listing

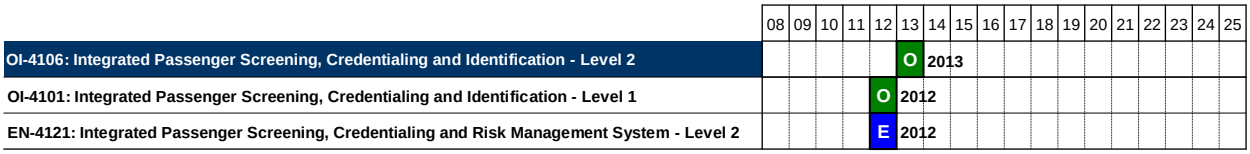
OI-4106 Integrated Passenger Screening, Credentialing and Identification - Level 2

Description: All passengers on commercial flights are prescreened and high risk passengers are identified through an enhanced vetting capability that utilizes an integrated watch list. This vetting system is integrated with the airlines passenger check-in processing capability. At all major airports, registered travelers have credentials that can be identified and verified through biometrics. Consideration should be given to the privacy issues associated with background checks on passengers.

SOPR: DHS ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Secure People Operational Improvements



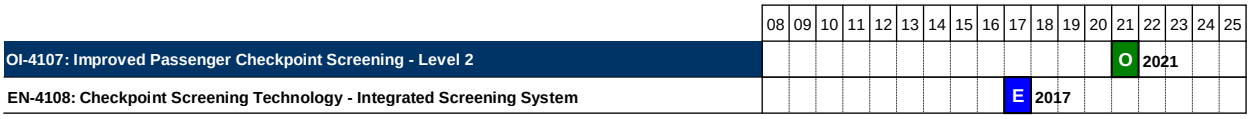
OI-4107 Improved Passenger Checkpoint Screening - Level 2

Description: Security is further improved for passenger screening by having integrated sensor technology that detects multiple threats in one system: explosives, chemicals, biological agents, nuclear devices, radiological material, and weapons. This improvement from level 1 would provide for improved levels of threat detection, lower false alarms, increased throughput, and improved alarm resolution of passengers. The check-point will balance the efficacy of the detecting system deployed with check-point physical space demands. Additionally, the overall footprint of the screening equipment will be much reduced thereby allowing for more space to screen the vastly increased number of passengers.

SOPR: DHS ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Secure People Operational Improvements



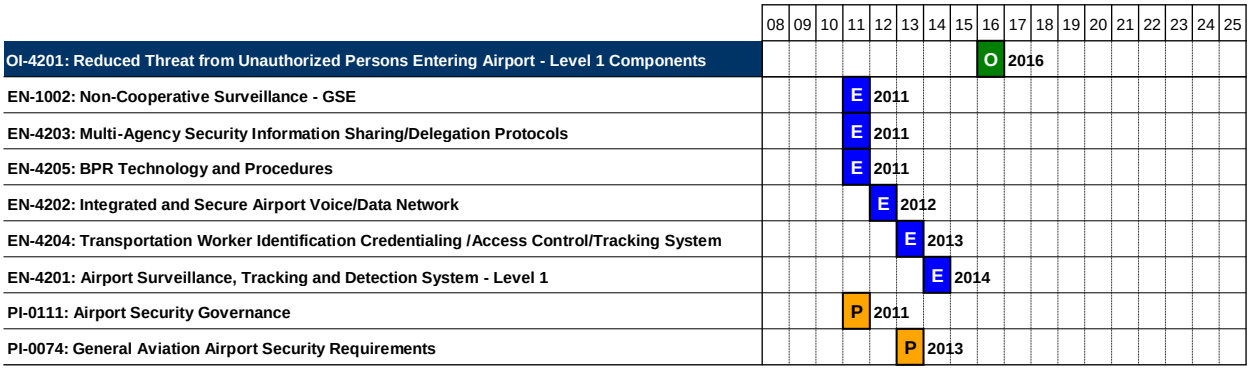
OI-4201 Reduced Threat from Unauthorized Persons Entering Airport - Level 1 Components

Description: Access control systems for persons and vehicles and facility surveillance networks use net-centric infrastructure to provide security in air/land side and vendor supply areas.

SOPR: DHS ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-4202

OI Group: Secure Airports Operational Improvements



Operational Improvement Listing

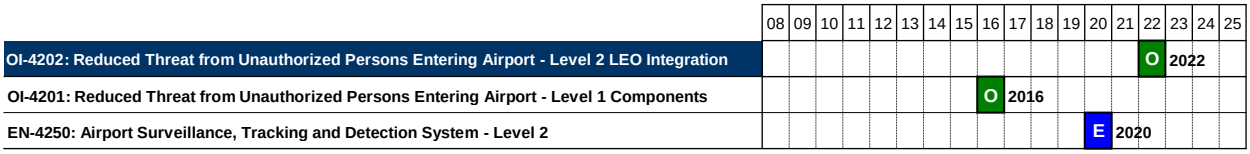
OI-4202 Reduced Threat from Unauthorized Persons Entering Airport - Level 2 LEO Integration

Description: Access control systems for persons and vehicles and facility surveillance integrated networks utilizing Net-Centric Infrastructure (NCI) to provide security in air/land side and vendor supply areas.

SOPR: DHS ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Secure Airports Operational Improvements



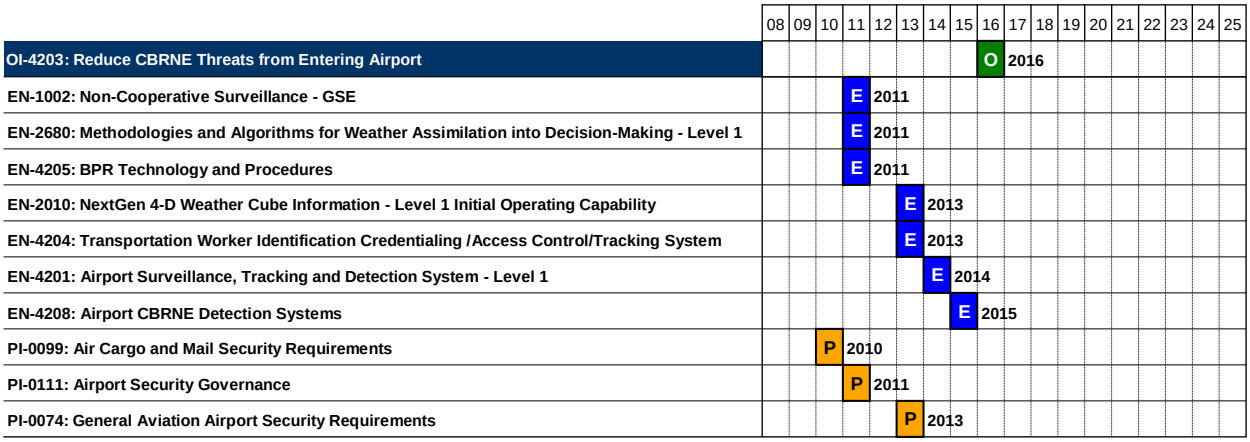
OI-4203 Reduce CBRNE Threats from Entering Airport

Description: Chemical, Biological, Radiological, Nuclear, and High-Yield Explosive (CBRNE) threats are mitigated through facility surveillance networks to enable Network Enabled Operation (NEO) integration, providing security in air and land side, and vendor supply areas.

SOPR: DHS ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Secure Airports Operational Improvements



OI-4204 Common and Synchronized Airport Emergency and Disaster Response

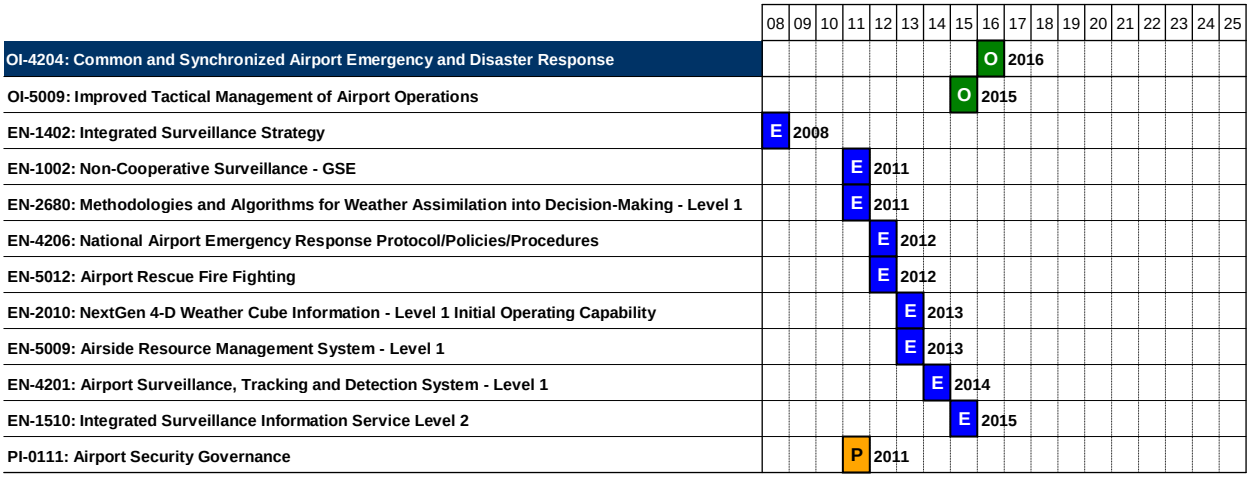
Description: Response to airport emergencies and disasters are executed following local standards that are in alignment with national standards and protocols. This alignment enables a seamless integration of regional and national response resources when needed. Additionally, integrated and standardized national and local shared situation awareness capabilities are used to enhance the coordination and collaboration among stakeholders involved in airport emergency response.

SOPR: DHS ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Secure Airports Operational Improvements

Operational Improvement Listing



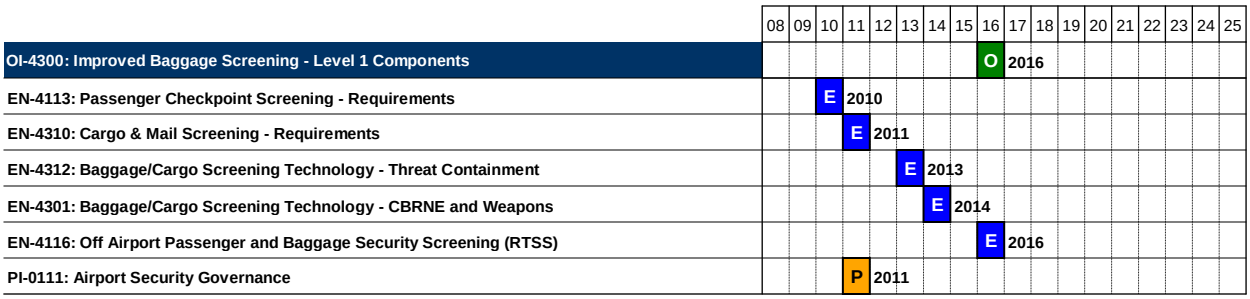
OI-4300 Improved Baggage Screening - Level 1 Components

Description: Security is enhanced by improved baggage screening for Chemical, Biological, Radiological, Nuclear, and High Yield Explosive (CBRNE) of passengers' checked baggage. These CBRNE screening systems have higher accuracy, higher throughput capacity, and smaller, lighter and have reduced footprints. The higher throughput could be further enhanced by utilizing the Remote Terminal Security Screening (RTSS) concept, moving the screening farther out from the airport. Current in-line systems will most likely be significantly enhanced and integrated with new and improved screening technologies.

SOPR: DHS ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-5015, OI-5014, OI-4301

OI Group: Secure Checked Baggage, Cargo and Mail Operational Improvements



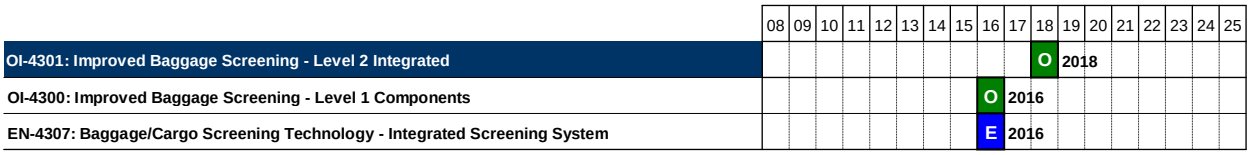
OI-4301 Improved Baggage Screening - Level 2 Integrated

Description: Checked baggage screening is further enhanced by integrated detection systems with sensor fusion and use of net-centric infrastructure. The systems are modularized for flexible deployment to meet airport demands. This screening system will be a single integrated system, rather that being composed of individual technologies. In-Line checked baggage screening systems will predominate, but size and category of airport will determine what kind of detection system will be needed. Some airports will require stand alone or integrated technology deployment.

SOPR: DHS ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Secure Checked Baggage, Cargo and Mail Operational Improvements



Operational Improvement Listing

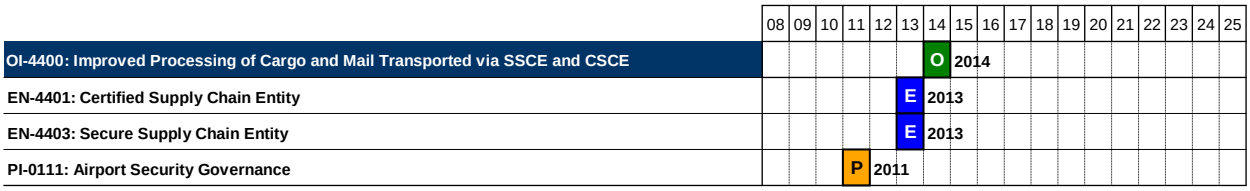
OI-4400 Improved Processing of Cargo and Mail Transported via SSCE and CSCE

Description: Air cargo/mail transportation system process includes prevention, detection, and mitigation measures to reduce the likelihood of cargo and mail from being used as a threat endangering aircraft, aviation facilities, and people. A Secure Supply Chain Entity (SSCE) and Certified Supply Chain Entity (CSCE) reduces the quantity of cargo/mail that requires screening prior to entering the air transportation system. This reduction in volume expedites the handling of cargo/mail, reduces shipping time, and increases the capacity of the air transportation system to move cargo/mail. Cargo/Mail is shipped through a SSCE by a CSCE which includes vetted cargo packers, a verified chain of custody, and tamper resistant/alerting technology to reduce the requirement to screen cargo before loaded on to an aircraft. Cargo shipped through the SSCE from a CSCE will not require further screening before entering the air transportation system.

SOPR: DHS ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Secure Checked Baggage, Cargo and Mail Operational Improvements



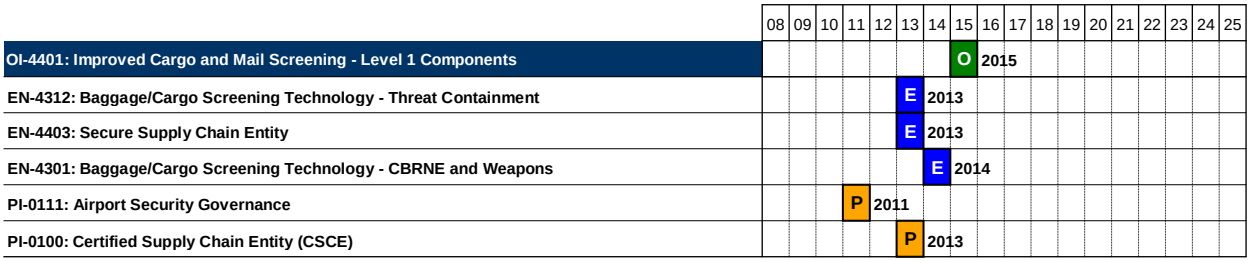
OI-4401 Improved Cargo and Mail Screening - Level 1 Components

Description: All cargo and mail not received from a Secure Supply Chain Entity (SSCE) and a Certified Supply Chain Entity (CSCE) will require Chemical, Biological, Radiological, Nuclear, and High Yield Explosive (CBRNE) screening for threat materials prior to loading on the aircraft prior to entry into the Air Transportation System (ATS).

SOPR: DHS ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-4403

OI Group: Secure Checked Baggage, Cargo and Mail Operational Improvements



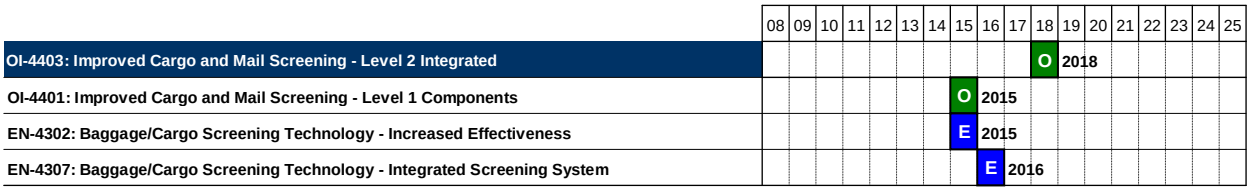
OI-4403 Improved Cargo and Mail Screening - Level 2 Integrated

Description: Cargo/Mail screening is further enhanced by integrated detection systems with sensor fusion and use of Net-Centric Infrastructure (NCI). The systems are modularized for flexible deployment to meet airport demands.

SOPR: DHS ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Secure Checked Baggage, Cargo and Mail Operational Improvements



Operational Improvement Listing

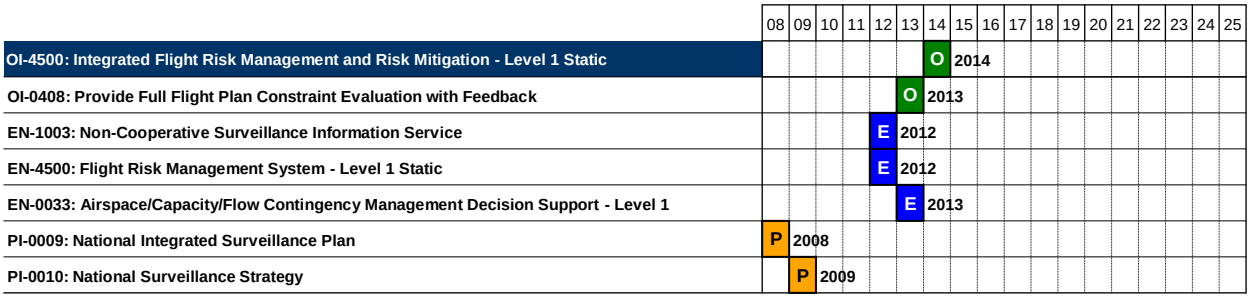
OI-4500 Integrated Flight Risk Management and Risk Mitigation - Level 1 Static

Description: High risk flights are identified pre-flight by the Security Service Provider (SSP) based on the information in existing databases maintained by the SSP and all its mission partners, both domestic and international. Air Navigation Service Provider (ANSP), SSP and the Defense Service Provider (DSP) have shared situational awareness with common surveillance data. Flights are continually monitored and assessed for risks based on their flight behaviors and new intelligence and other information. Once a threat is identified by the SSP and/or the DSP, alert notifications are provided to the ANSP and the defense/security service providers to coordinate integrated response for risk mitigation facilitated by secure communications and information sharing.

SOPR: DHS ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-4502

OI Group: Secure Airspace Operational Improvements



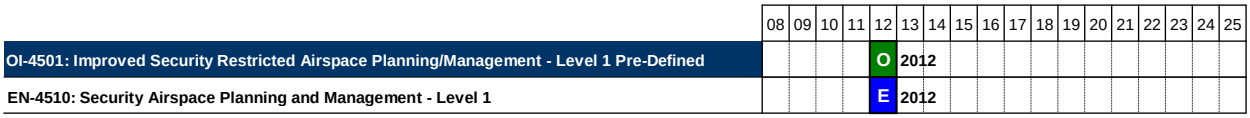
OI-4501 Improved Security Restricted Airspace Planning/Management - Level 1 Pre-Defined

Description: Security Restricted Airspace (SRA) is a component of the NextGen Secure Airspace concept. This concept could accommodate current security airspace types such as Special Use Airspaces(SUAs), Temporary Flight Restrictions (TFRs), Military Training Routes (MTRs), National Security Airspace (NSA), and Air Defense Identification Zone/Flight Restricted Zone (DC ADIZ/FRZ). SRA is defined and managed by the Air Navigation Service Provider (ANSP) or its designee using an airspace planning, configuration, and distribution capability to establish time-dependent and risk-based security restriction parameters that are pre-defined. Such parameters consider impact on the overall national airspace system due to security. For security airspace that are public, airspace security information is provided to all users with an improved Notice to Airmen (NOTAM) system. A specific waiver database is in place to keep track of security airspace waivers.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-4511

OI Group: Secure Airspace Operational Improvements



OI-4502 Integrated Flight Risk Management and Risk Mitigation - Level 2 Dynamic

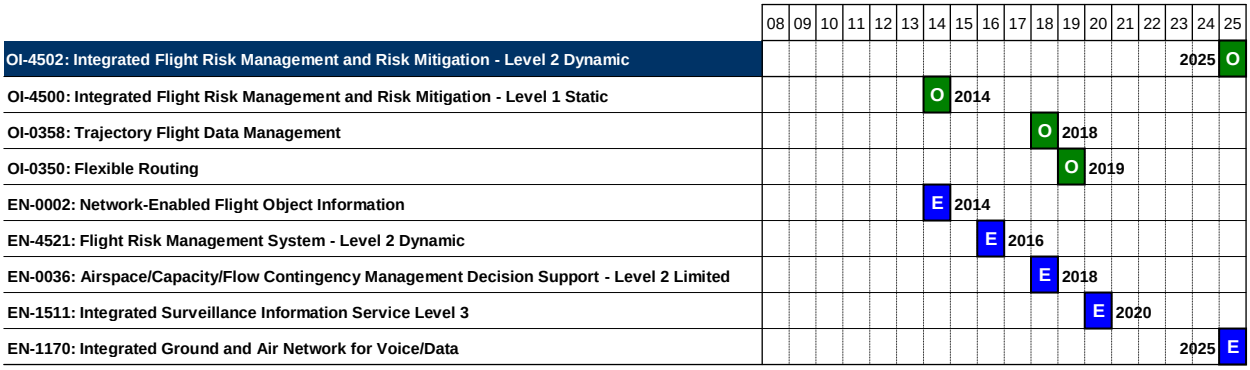
Description: High risk flights are identified by the Security Service Provider (SSP) pre-flight based on the information in existing databases maintained by the SSP and its mission partners. Specific flight risks are communicated as risk levels to enable Air Navigation Service Provider (ANSP) to monitor and manage the risks as part of their provision of Air Traffic Management (ATM) services. ANSP, SSP and Defense Service Provider have shared situational awareness with geo-spatial visualization of surveillance layered with ground assets/activities. Flights are continually monitored and assessed for risks based on flights' 4DT behaviors observed by the ANSP, coupled with security elements of the flight object maintained by the SSP and/or the Defense Service Provider. Automation with decision support capabilities are available to correlate and identify anomalous behaviors (e.g., on-board aircraft security situation, multiple security events, airspace violations based on trajectories or real-time surveillance data, and out of conformance monitoring). Once a threat is identified by the SSP and/or the Defense Service Provider, alert notifications are provided to the ANSP. ANSP/SSP/Defense Service Provider coordinate integrated response for risk mitigation facilitated by secure communications and information sharing. The magnitude of response decision is assisted by automation to consider the impact to the overall airspace.

SOPR: DHS ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Secure Airspace Operational Improvements

Operational Improvement Listing



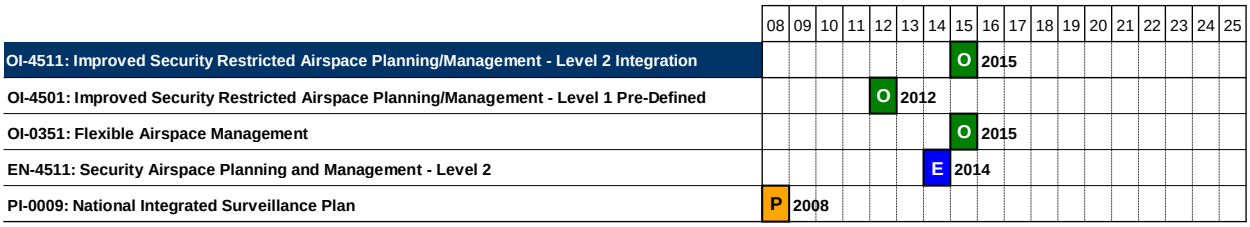
OI-4511 Improved Security Restricted Airspace Planning/Management - Level 2 Integration

Description: Security Restricted Airspace (SRA) is defined and managed by the Air Navigation Service Provider (ANSP) or its designee using an airspace planning, configuration, and distribution capability to establish time-dependent and risk-based security restriction parameters that are pre-defined. Such parameters consider impact on the overall national airspace system due to security. For those security airspace that are public, airspace security information is provided to all users with an enhanced digital Notice to Airmen (NOTAM) system. A specific waiver database is in place to keep track of security airspace waivers and waivers are automatically shared with security stakeholders and are integrated with flight risk management capability

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-4512

OI Group: Secure Airspace Operational Improvements



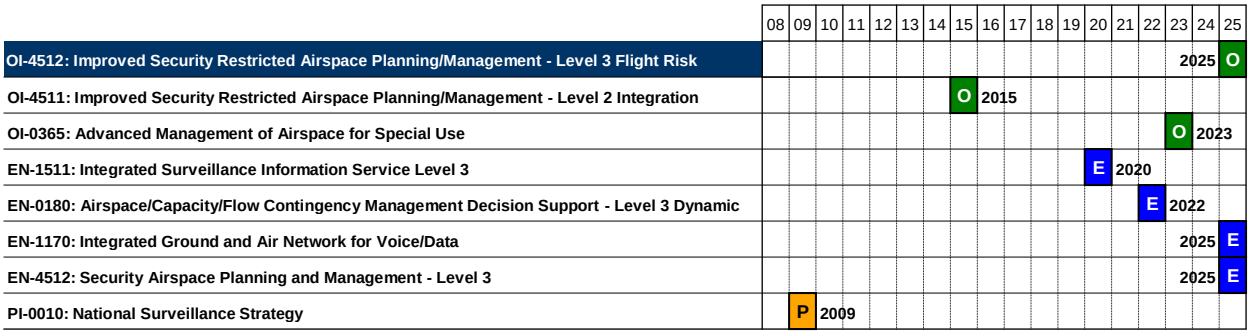
OI-4512 Improved Security Restricted Airspace Planning/Management - Level 3 Flight Risk

Description: Security Restricted Airspace (SRA) is defined and managed by the Air Navigation Service Provider (ANSP) or its designee using an integrated airspace planning, configuration, and distribution capability to establish time-dependent and risk-based security restriction parameters. The SRA is adaptive to flight risk. Flights with different risk profiles will have different access characteristics. Such adaptive parameters minimize impact on the overall airspace due to security and improve overall airspace access. Airspace security information is automatically sent to the cockpit.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Secure Airspace Operational Improvements



Operational Improvement Listing

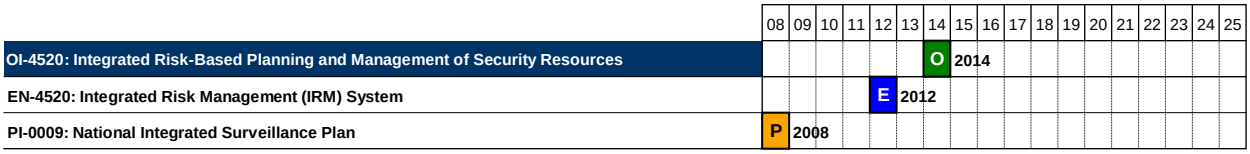
OI-4520 Integrated Risk-Based Planning and Management of Security Resources

Description: Security resources are planned, and managed using an integrated, adaptive, and responsive risk management capability that supports risk-informed decisions among security mission partners. This capability harmonizes short and long term resource allocation (e.g., airport checkpoint screeners and Federal Air Marshall Services (FAMs)) and investments among partners (e.g., airport screening equipment) to gain the highest possible security return on investment and to reduce the overall cost of security operations within the aviation transportation system.

SOPR: DHS ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-4521

OI Group: Integrated Risk Management Operational Improvements



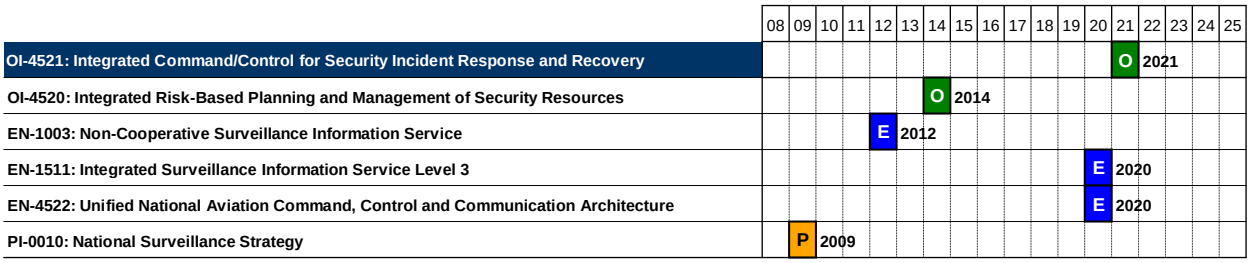
OI-4521 Integrated Command/Control for Security Incident Response and Recovery

Description: Security and defense service providers, supported by the Air Navigation Service Providers (ANSP), jointly manage security resources and coordinate and respond to security incidents by using an integrated security command and control capability that includes unified security operations protocols, communications, procedures, and tactics. This provides a seamless aviation security operation system that is adaptive and responsive to the emerging threats.

SOPR: DHS ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Integrated Risk Management Operational Improvements



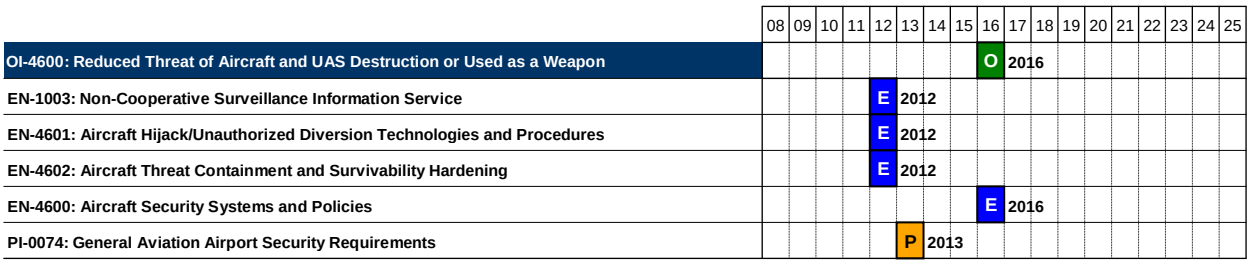
OI-4600 Reduced Threat of Aircraft and UAS Destruction or Used as a Weapon

Description: The security and safety of aircraft and Unmanned Aircraft Systems (UAS) is increased by reducing the probability of aircraft, including UAS, from being hijacked either locally or through remote control, used as a Weapon of Mass Destruction (WMD), internal explosive destruction, onboard Chemical, Biological, Radiological, Nuclear, and High Yield Explosive (CBRNE) threat, or as a transport for CBRNE.

SOPR: DHS ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Secure Aircraft and UAS Operational Improvements



Operational Improvement Listing

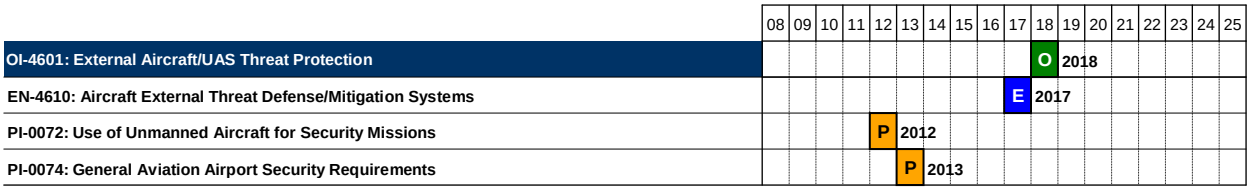
OI-4601 External Aircraft/UAS Threat Protection

Description: The safety and security of aircraft and Unmanned Aircraft System (UAS) against external threats is increased by incorporating on-board systems that leverage safety modifications, supplemented by ground based and procedural systems to provide protection against Light Amplification by Stimulated Emission of Radiation (LASERS), Man-Portable Air Defense System (MANPADS), directed energy or electronic pulse threats Electromagnetic Pulse (EMP).

SOPR: DHS ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Secure Aircraft and UAS Operational Improvements



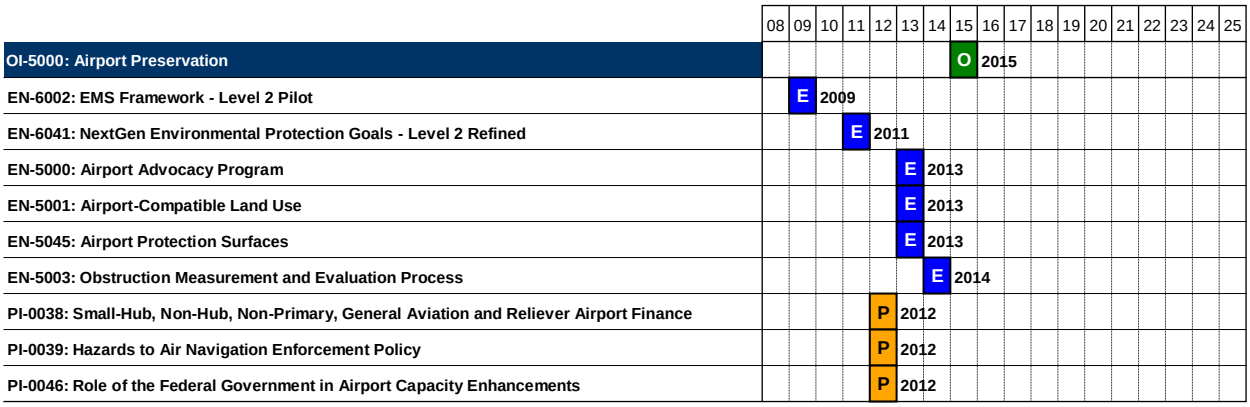
OI-5000 Airport Preservation

Description: A diverse network of airports is preserved throughout the nation in the best interest of a sustainable national air transportation system. The primary goal of the program is to maintain a network of regional airports to support increases in general aviation and commercial service as hub airports reach capacity. Airport sustainability is achieved through local community support, intermodal connections, operator access, as well as the balancing of economic, social and environmental considerations.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-5002, OI-5003, OI-5004, OI-5005

OI Group: Airport Support Operational Improvements



OI-5002 Improved Strategic Management of Existing Infrastructure (Airside)

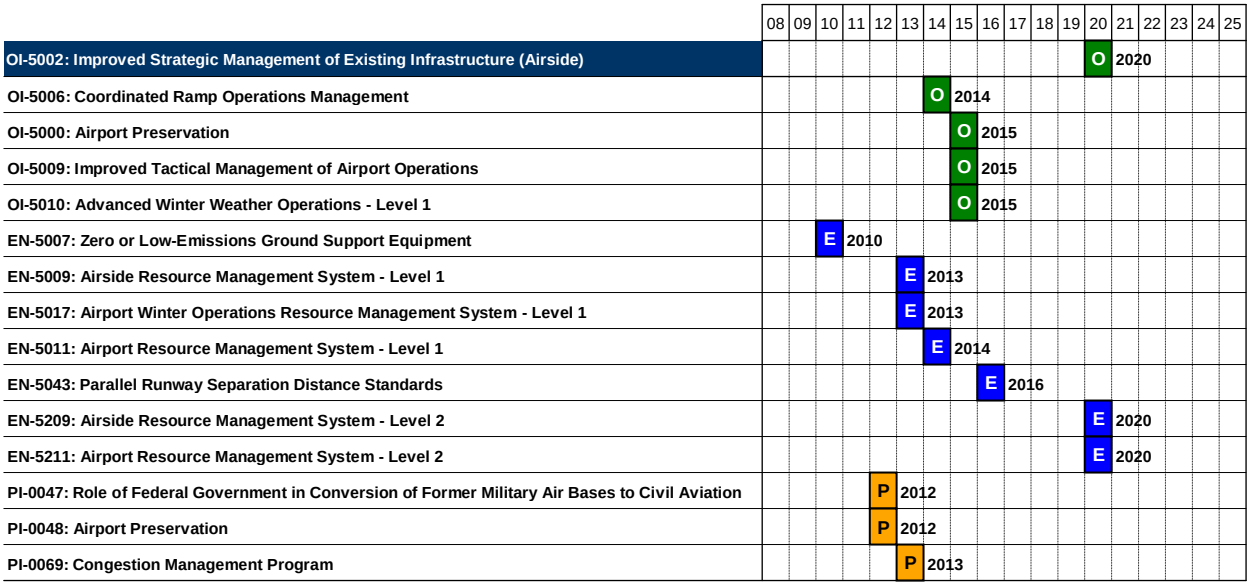
Description: Use of existing airport airside infrastructure is maximized. Airport airside infrastructure includes tarmac, emergency response vehicles, deicing, and the surface management infrastructure.

SOPR: Airport Operator ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Airport Support Operational Improvements

Operational Improvement Listing



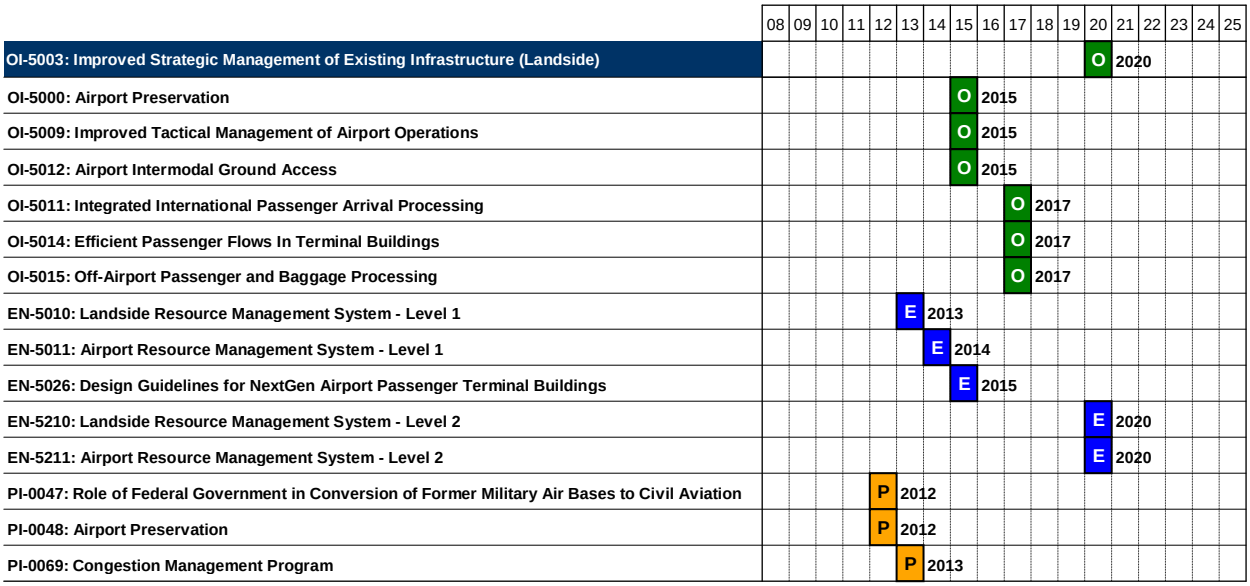
OI-5003 Improved Strategic Management of Existing Infrastructure (Landside)

Description: Use of existing airport landside infrastructure is optimized. Airport landside infrastructure includes gates, security, customs, baggage handling, cargo handling.

SOPR: Airport Operator ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Airport Support Operational Improvements



OI-5004 New Airside Airport Infrastructure

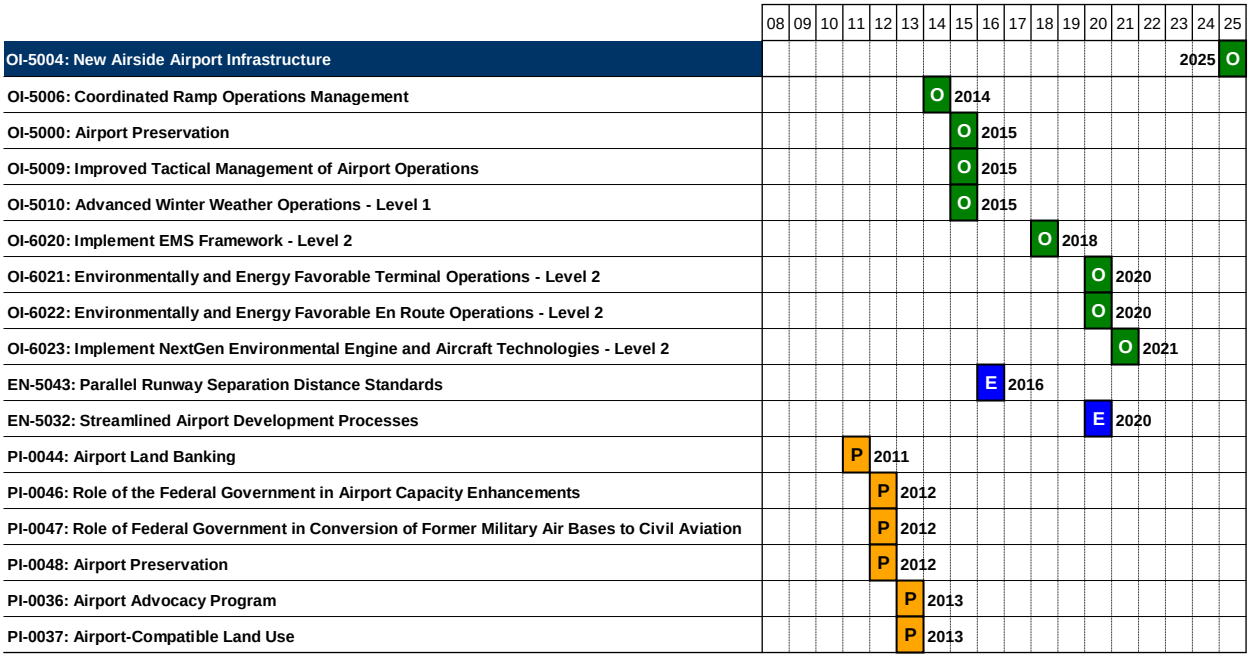
Description: New airside airport infrastructure is developed to support aviation growth in a safe, secure, efficient, and environmentally compatible/sustainable manner. Environmental sustainability goals include (1) providing environmental protection that supports and sustains aviation growth and (2) reducing environmental constraints on adding airport capacity.

SOPR: Airport Operator ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Airport Support Operational Improvements

Operational Improvement Listing



OI-5005 New Landside Airport Infrastructure

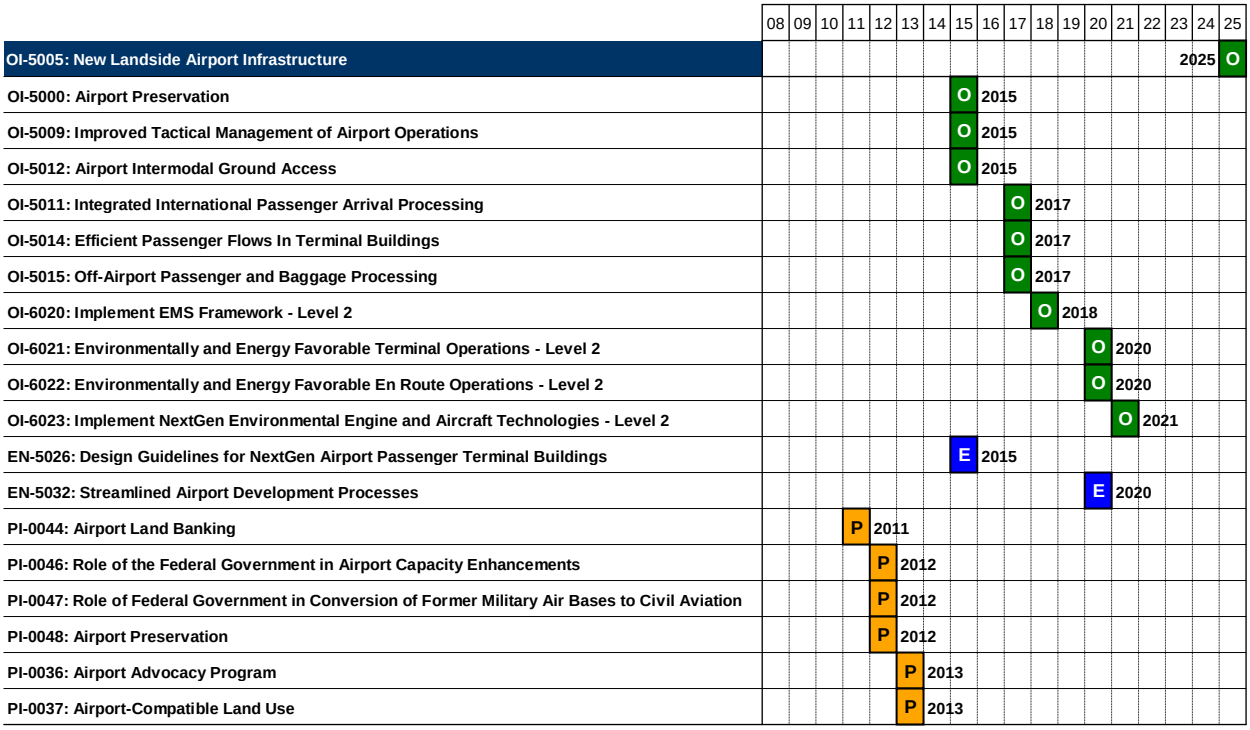
Description: New landside airport infrastructure is developed to support aviation growth in a safe, secure, efficient, and environmentally compatible/sustainable manner. Environmental sustainability goals include (1) providing environmental protection that supports and sustains aviation growth, (2) reducing environmental constraints on adding airport capacity, and (3) incorporating mass transit and intermodal connections regionally in support of flight operations.

SOPR: Airport Operator ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Airport Support Operational Improvements

Operational Improvement Listing



OI-5006 Coordinated Ramp Operations Management

Description: Surface movements of Ground Support Equipment (GSE) are monitored and proactively managed using net-centric infrastructure in real-time, to ensure the smooth, efficient, and safe flow of vehicular traffic. GSE has equipment to ensure accurate navigation during low-visibility conditions, maintain clearance from active runway and taxiways, and separation from aircraft. Congestion is reduced while improving level of service, environmental benefits, and safety (including use of Safety Management System [SMS] procedures). GSE requirements for surveillance and communications requirements are compatible with aircraft surface traffic management systems. Additional definition on ramp management, surface management, and gate management is TBD.

SOPR: Airport Operator ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-5009, OI-5008, OI-5002, OI-5004

OI Group: Airport Operations Operational Improvements

OI-5008 Advanced Weather Capability for Airside Facilities

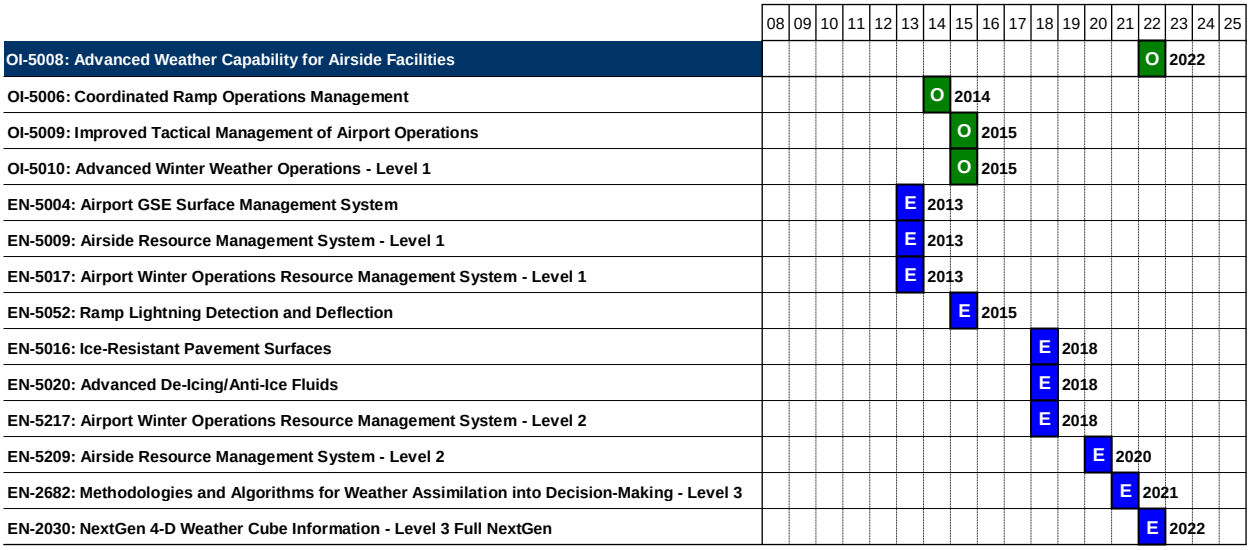
Description: Airside facilities are open during severe weather conditions. Technology, systems, and procedures support airport operators in more effectively keeping airside facilities open and fully functional during severe conditions. This includes the proactive scheduling of maintenance and weather-response activities such as clearing runways of snow and ice. During thunderstorms, ramp closures due to lightning occur less frequently and have a shorter duration with weather forecasts, lightning detection, and/or lightning deflection. Delays and congestion that occur due to inclement weather and non-nominal airfield conditions are reduced.

SOPR: Airport Operator ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Airport Operations Operational Improvements

Operational Improvement Listing



OI-5009 Improved Tactical Management of Airport Operations

Description: Airport operators will be able to effectively manage routine and emergency operations through improved data and monitoring capabilities, as well as linkages to net centric infrastructure and regional/national emergency response resources. This includes real-time push of airport condition information to users, Air Navigation Service Provider (ANSP), Security Service Provider (SSP) and others.

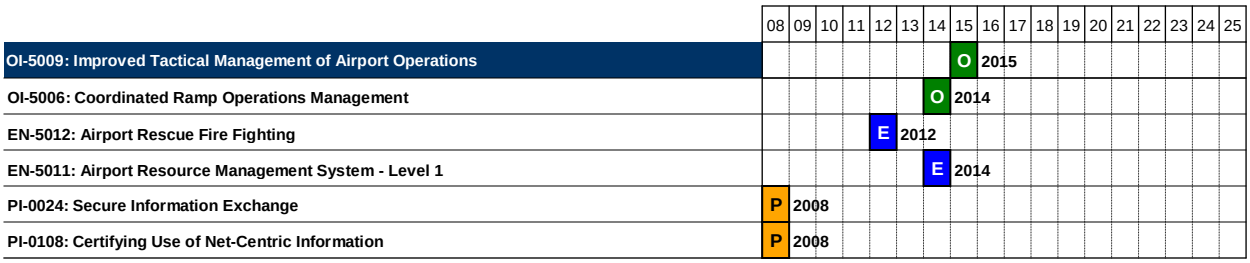
SOPR: Airport Operator

SOPR Unique Reference:

SOCR:

Primary Supported OIs: OI-5008, OI-5002, OI-5003, OI-5004, OI-5005, OI-4204

OI Group: Airport Operations Operational Improvements



OI-5010 Advanced Winter Weather Operations - Level 1

Description: During winter weather, aircraft are anti-iced/deiced more efficiently through resource management systems. Icing holdover times are incorporated into 4DT in order to facilitate departure queuing and enhance safety. Clearing of airport movement surfaces of frozen precipitation is also enhanced through detailed weather information and improved utilization of airport equipment.

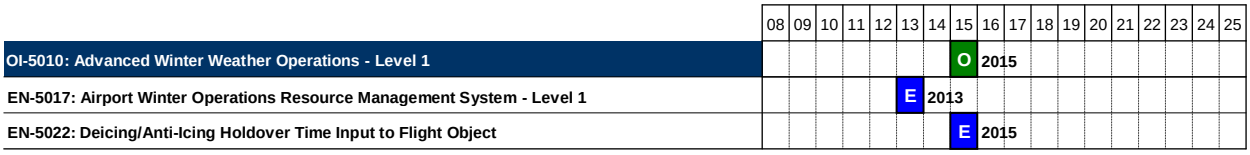
SOPR: Airport Operator

SOPR Unique Reference:

SOCR:

Primary Supported OIs: OI-5110, OI-5008, OI-5002, OI-5004

OI Group: Airport Operations Operational Improvements



Operational Improvement Listing

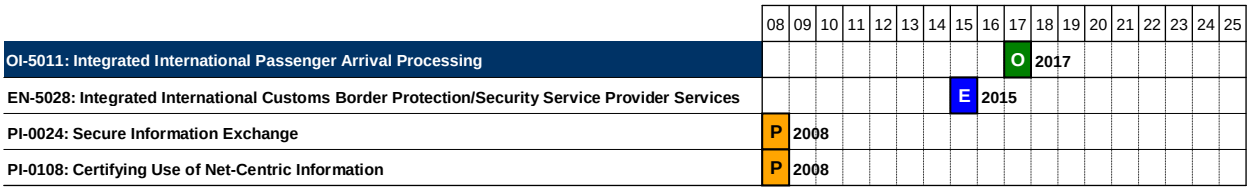
OI-5011 Integrated International Passenger Arrival Processing

Description: Through improved procedures, enhanced international agreements, and information flow, Security Service Provider (SSP) processing is more efficient for arriving international passengers, enabling faster processing times while maintaining Immigration, Customs, and Security requirements. Network Enabled Operation (NEO) supports transfer of passenger and baggage manifests between aircraft operators and SSP. Redundant processing and screening is reduced or eliminated. US participation in International Civil Aviation Organization (ICAO) and other international aviation governing bodies to coordinate identical or equivalent baggage check and check-point screening policies for passenger air transportation. In order to maintain security and promote screening efficiency, identical or equivalent baggage check and check-point screening policies and procedures between US and foreign governments must be harmonized.

SOPR: DHS ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-5003, OI-5005

OI Group: Secure People Operational Improvements



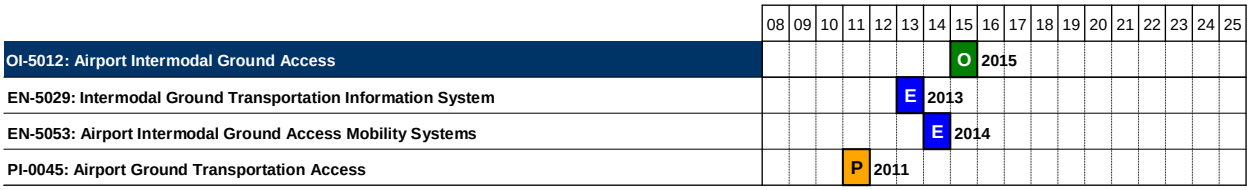
OI-5012 Airport Intermodal Ground Access

Description: Effective and efficient ground access is an important component of the air transportation system and ensures that passengers and cargo can get to/from the airport with reasonable trip times and costs. Intermodal transportation options that provide ground access at airports include private automobiles, trucks, public rail and bus transit, taxicabs, rental cars, and shuttle services. In many regions, congested roads significantly constraint convenient access to aviation services. Accordingly, airport operators will need to work with users, Metropolitan Planning Organizations (MPOs), and state and local governments to serve their community's transportation needs by addressing ground access constraints as part of regional system planning efforts. While most passengers and cargo will likely continue to use automobiles and trucks, the increased use of high-density transportation modes may be necessary in regions where roadway expansion or new construction is not feasible. There may also be environmental benefits resulting from the reduced air emissions associated with high-density transportation utilization that replaces automobile trips. The evolution of certain airside/landside interfaces, like remote check-in facilities, will also act to improve the transfer of passengers and cargo between transportation networks. In certain mega-regions with congested airport systems, high-density intermodal transportation systems may supplement existing short-haul air service while providing improved ground-to-air connections for long-haul air service. To best serve passenger and cargo operational needs, air services will connect with intermodal transportation as appropriate within each regional transportation system.

SOPR: Airport Operator ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-5003, OI-5005

OI Group: Airport Operations Operational Improvements



OI-5014 Efficient Passenger Flows In Terminal Buildings

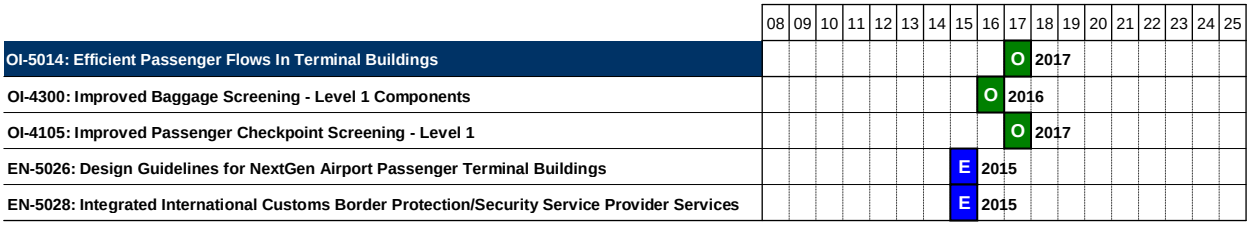
Description: Passenger flows through terminal buildings are smooth and predictable due to advanced signage (including universally accepted way finding signage policy) and infrastructure that is aligned to facilitate efficient movements. Sensors in place for security may also be used for dual purposes, e.g., to provide better Shared Situational Awareness (SSA) of passenger flows including identification of constraints with check-in, baggage, and other terminal functions that affect passenger movements. Managing passenger flows is especially important during peak operating periods and super density operations to ensure that passengers can move from the curb to the gate/gate to curb in an efficient, predictable, and hassle-free manner.

SOPR: Airport Operator ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-5003, OI-5005

OI Group: Airport Operations Operational Improvements

Operational Improvement Listing



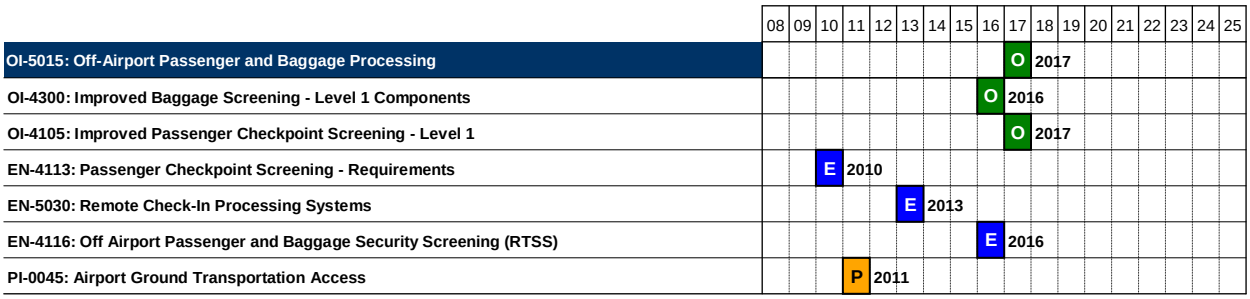
OI-5015 Off-Airport Passenger and Baggage Processing

Description: Remote processing locations (e.g., hotels, conference centers, modal transportation, and Remote Terminal Security Service facilities) enable check-in, baggage check, and security screening at off-airport locations. Passengers and baggage would be transported to the airport via secure ground transportation for connections directly to the secure portions of the terminal. Passenger and baggage itinerary information is tracked using advanced technology to support synchronization, handling information, remote check-in, and security assurance. Management of the off-site processing and baggage transfer service by the airport operator, airline(s), and/or third-party vendor(s) would be supported, as appropriate to the airport. Airports that have limited room to expand their terminal facilities would benefit and be able to support higher passenger volumes while maintaining an acceptable level of service. Roadway congestion to/from the airport would also be reduced.

SOPR: Airport Operator ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-5003, OI-5005

OI Group: Airport Operations Operational Improvements



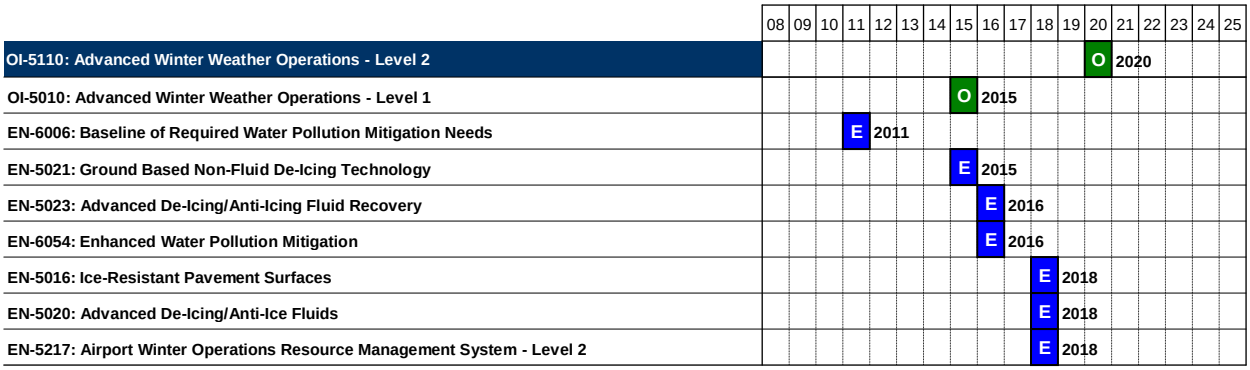
OI-5110 Advanced Winter Weather Operations - Level 2

Description: During winter weather, aircraft and airport movement surfaces are anti-iced/deiced more efficiently through resource management and new ground-based technology. Deicing/anti-icing fluids and methods are more effective with less environmental impact. Collection methods capture spent fluids for recycling.

SOPR: Airport Operator ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Airport Operations Operational Improvements



Operational Improvement Listing

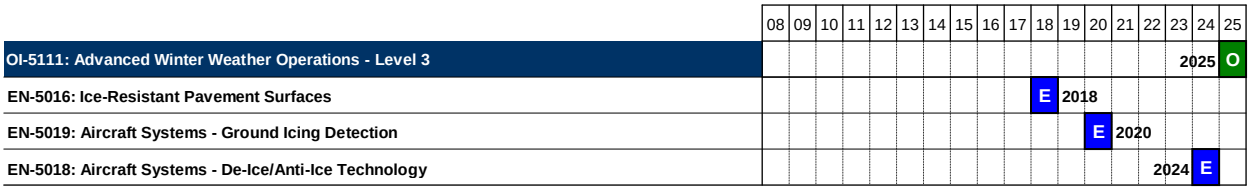
OI-5111 Advanced Winter Weather Operations - Level 3

Description: During winter weather, aircraft are anti-iced/deiced more efficiently through resource management and new aircraft-based technology. Newly built aircraft have imbedded sensors to alert pilots about icing and also have de-icing capabilities. Additionally, some airports may have ice resistant pavement surfaces to improve their capabilities during winter weather operations.

SOPR: Airport Operator ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: Airport Operations Operational Improvements



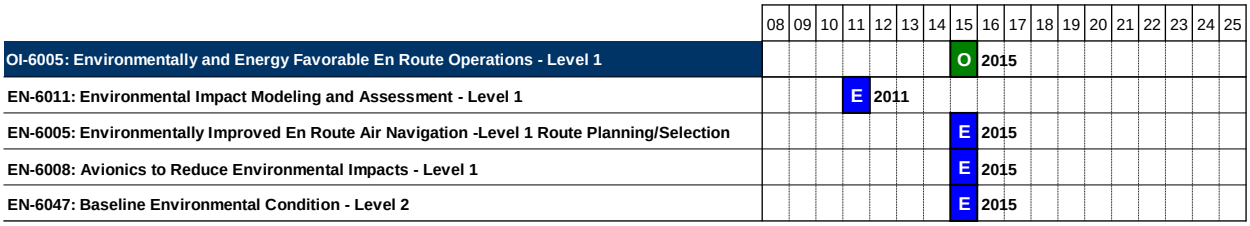
OI-6005 Environmentally and Energy Favorable En Route Operations - Level 1

Description: Optimize En Route operations to reduce emission, fuel burn and noise. Advanced aircraft technologies support operational capabilities that reduce environmental impacts, to include capabilities for Flight Management Systems (FMS) and avionics to support energy management guidance that support en route operations. Undertake, as appropriate, operational procedures that include reduction of noise over national parks.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-6022

OI Group: EMF Operational Improvements



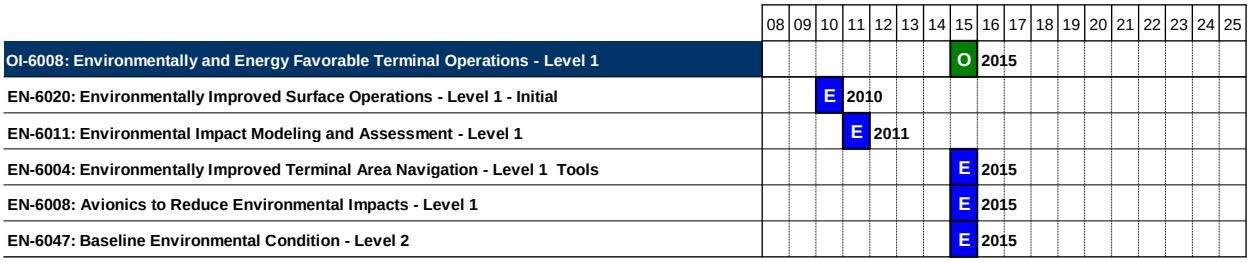
OI-6008 Environmentally and Energy Favorable Terminal Operations - Level 1

Description: Optimize aircraft arrival, departure, and surface operations to reduce emissions, fuel burn, and noise through the use of environmentally friendly procedures. Develop Standard Terminal Arrival (STAR) procedures that permit use of the Optimized Profile Descent (OPD) technique (also known as Continuous Descent Arrival, or CDA). Develop area navigation (RNAV) Standard Instrument Departure (SID) procedures that minimize level segments on climb out. Develop enhanced surface operation mechanisms and procedures to maximize airport throughput while further reducing aircraft fuel burn and emissions.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-6021

OI Group: EMF Operational Improvements



Operational Improvement Listing

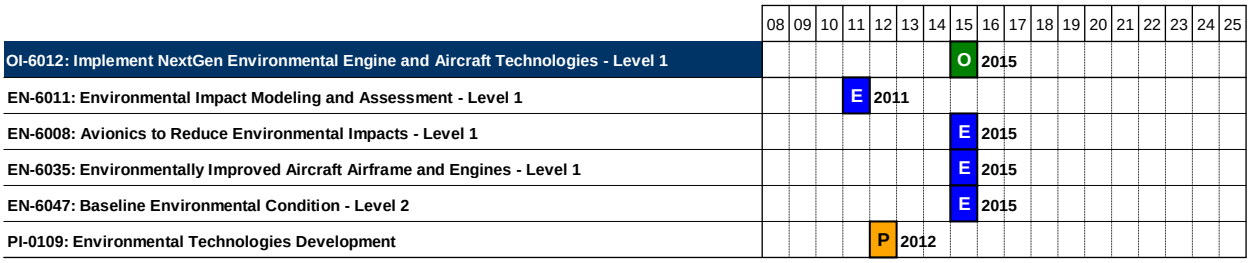
OI-6012 Implement NextGen Environmental Engine and Aircraft Technologies - Level 1

Description: Reductions in aircraft noise, emissions, and fuel burn through improvements in aircraft engine and airframe technologies and alternative fuels. Technologies will be at sufficient readiness level to achieve the goals of the Federal Aviation Administration (FAA) Continuous Low Emissions, Energy, and Noise (CLEEN) program.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-6023

OI Group: EMF Operational Improvements



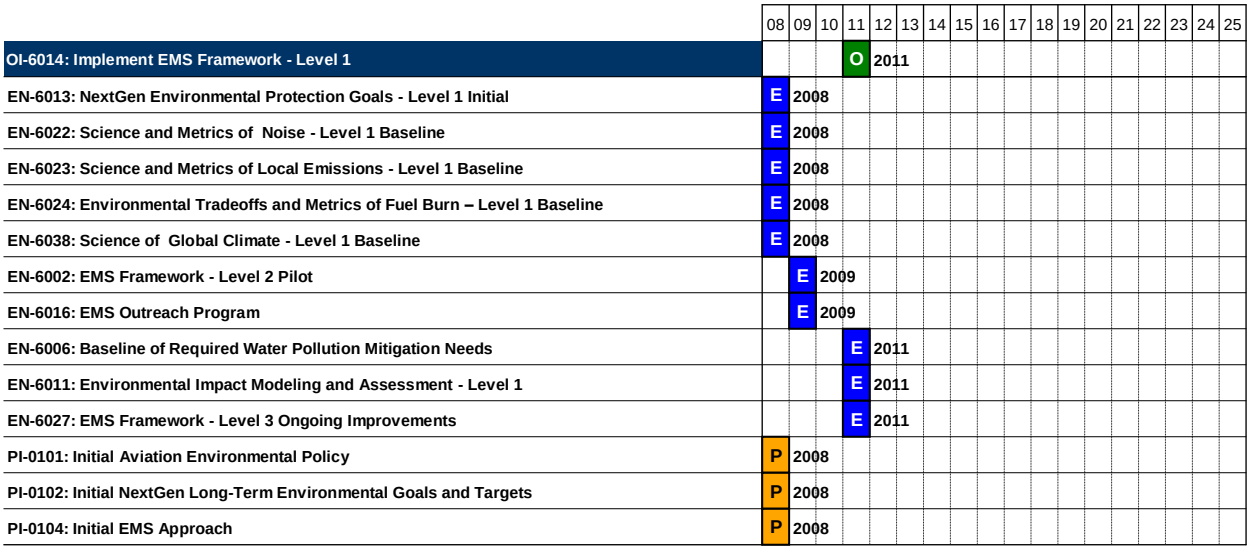
OI-6014 Implement EMS Framework - Level 1

Description: Enable the use of the Environmental Management System (EMS) framework, including environmental goals and decision support tools, to address, plan and mitigate environmental issues, through development of an initial EMS framework, pilot analysis, and outreach programs.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:*** OI-6020

OI Group: EMF Operational Improvements



OI-6017 Increased Use of Alternative Aviation Fuels

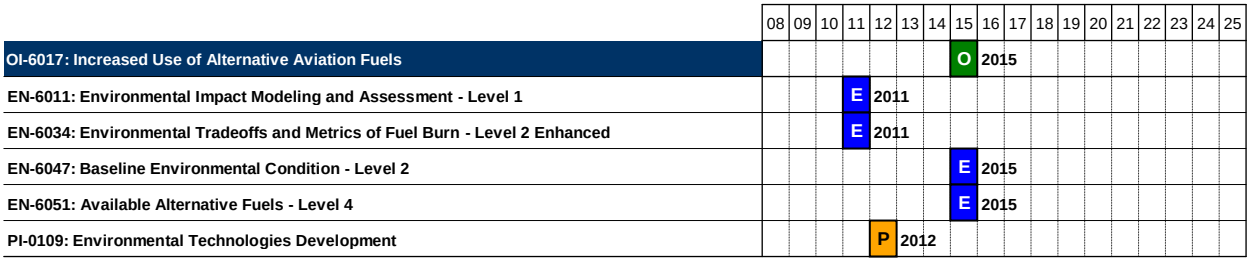
Description: Determine the feasibility and market viability of alternative aviation fuels for civil use. Obtain American Society for Testing and Materials (ASTM) certification of Synthetic Paraffinic Kerosene (SPK) fuels from fossil and renewable resources that are compatible with existing infrastructure and fleet thus meeting requirement to be a “drop in” alternative fuel.

SOPR: FAA ***SOPR Unique Reference:***

SOCR: ***Primary Supported OIs:***

OI Group: EMF Operational Improvements

Operational Improvement Listing



OI-6020 Implement EMS Framework - Level 2

Description: Further enable the use of the Environmental Management System (EMS) framework for subsequent applications, including refined environmental goals and decision support tools, to address, plan and mitigate environmental issues through implementation of ongoing EMS improvements and availability of enhanced environmental information.

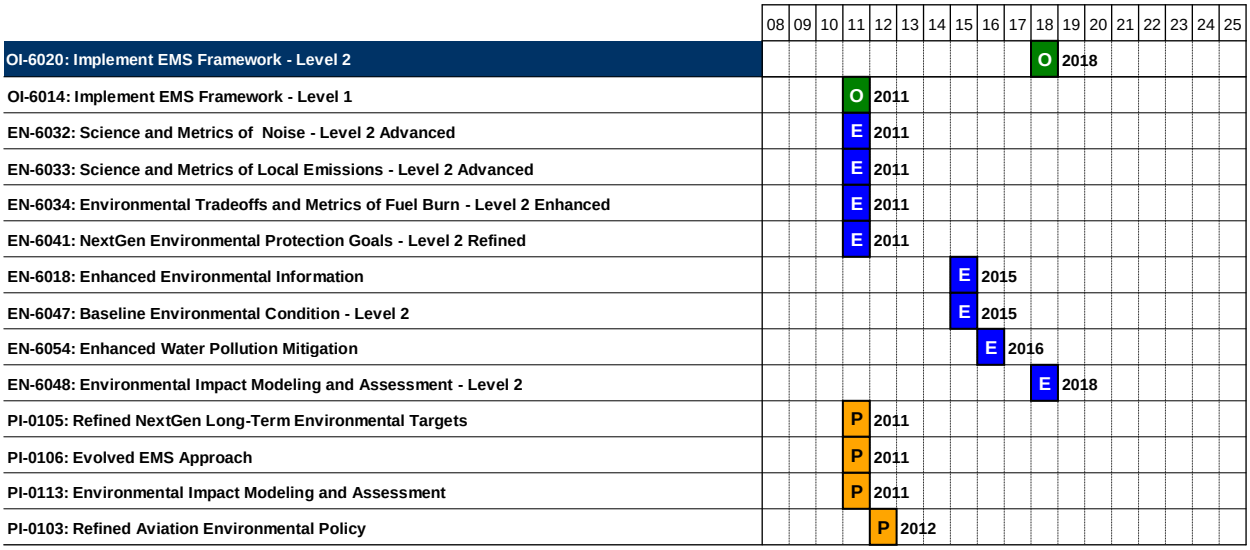
SOPR: FAA

SOPR Unique Reference:

SOCR:

Primary Supported OIs: OI-5004, OI-5005

OI Group: EMF Operational Improvements



OI-6021 Environmentally and Energy Favorable Terminal Operations - Level 2

Description: Further optimization of aircraft arrival, departure, and surface operations to reduce emissions, fuel burn, and noise. Use of environmentally friendly procedures and Environmental Management System (EMS) provided routes, such as Optimized Profile Descent (OPD)/Area Navigation (RNAV) procedures and use of automation and enhanced surveillance to schedule and control arriving and departing aircraft in an optimum manner to reduce environment and energy use impacts. OPD is also known as Continuous Descent Arrival (CDA).

SOPR: FAA

SOPR Unique Reference:

SOCR:

Primary Supported OIs: OI-5004, OI-5005

OI Group: EMF Operational Improvements

Operational Improvement Listing

	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
OI-6021: Environmentally and Energy Favorable Terminal Operations - Level 2													O 2020					
OI-6008: Environmentally and Energy Favorable Terminal Operations - Level 1								O 2015										
EN-6053: Science of Global Climate - Level 2 Advanced				E 2011														
EN-6046: Environmentally Improved Surface Operations - Level 2 - Enhanced								E 2015										
EN-6042: Environmentally Improved Terminal Area Navigation - Level 2 Automation/Mechanisms											E 2018							
EN-6044: Avionics to Reduce Environmental Impacts - Level 2											E 2018							
EN-6048: Environmental Impact Modeling and Assessment - Level 2											E 2018							
EN-6043: Environmentally Improved Terminal Area Navigation - Level 3 Dynamic Information													E 2020					
EN-6045: Avionics to Reduce Environmental Impacts - Level 3													E 2020					
PI-0112: Dynamic Environmental Management Systems Approach								P 2015										

OI-6022 Environmentally and Energy Favorable En Route Operations - Level 2

Description: Further optimization of En Route operations to reduce emission, fuel burn and noise. Utilize environmental management system embedded into real time route planning to reduce environmental impact. Undertake, as appropriate, operational procedures that include reduction of noise over national parks.

SOPR: FAA

SOPR Unique Reference:

SOCR:

Primary Supported OIs: OI-5004, OI-5005

OI Group: EMF Operational Improvements

	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
OI-6022: Environmentally and Energy Favorable En Route Operations - Level 2													O 2020					
OI-6005: Environmentally and Energy Favorable En Route Operations - Level 1								O 2015										
EN-6039: Enhanced Global Climate Metrics				E 2011														
EN-6053: Science of Global Climate - Level 2 Advanced				E 2011														
EN-6030: Environmentally Improved En Route Air Navigation -Level 2 Dynamic Routing											E 2018							
EN-6044: Avionics to Reduce Environmental Impacts - Level 2											E 2018							
EN-6048: Environmental Impact Modeling and Assessment - Level 2											E 2018							
EN-6045: Avionics to Reduce Environmental Impacts - Level 3													E 2020					
PI-0112: Dynamic Environmental Management Systems Approach								P 2015										

OI-6023 Implement NextGen Environmental Engine and Aircraft Technologies - Level 2

Description: Further enable reductions in aircraft noise, emissions, and fuel consumption by incorporating Next-Generation improvements in aircraft engine and airframe technologies, alternative fuels, and national airspace system infrastructure optimization.

SOPR: NASA

SOPR Unique Reference:

SOCR:

Primary Supported OIs: OI-5004, OI-5005

OI Group: EMF Operational Improvements

	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
OI-6023: Implement NextGen Environmental Engine and Aircraft Technologies - Level 2														O 2021				
OI-6012: Implement NextGen Environmental Engine and Aircraft Technologies - Level 1								O 2015										
EN-6044: Avionics to Reduce Environmental Impacts - Level 2											E 2018							
EN-6048: Environmental Impact Modeling and Assessment - Level 2											E 2018							
EN-6045: Avionics to Reduce Environmental Impacts - Level 3													E 2020					
EN-6037: Environmentally Improved Aircraft Airframe and Engines - Level 2														E 2021				